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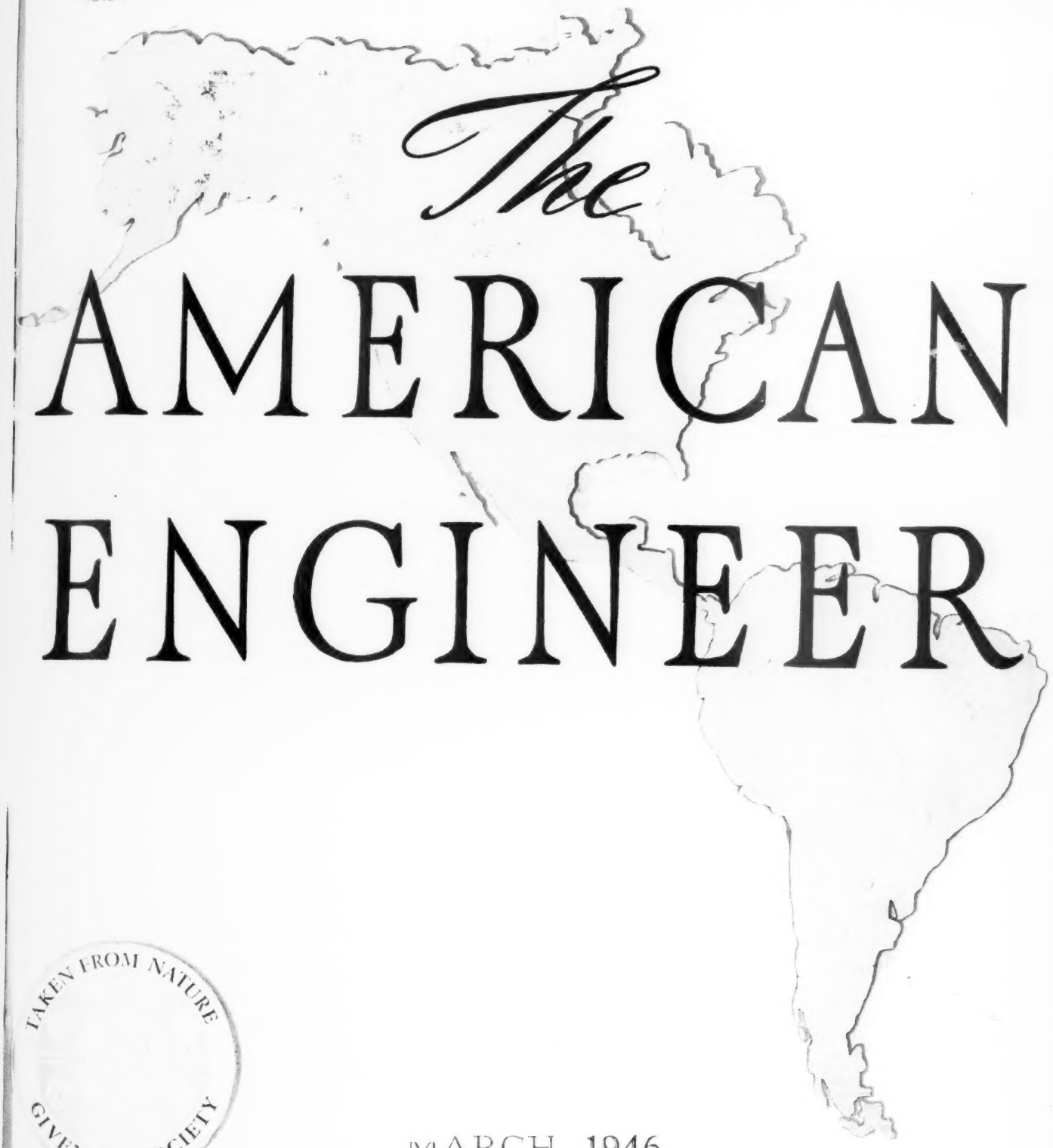

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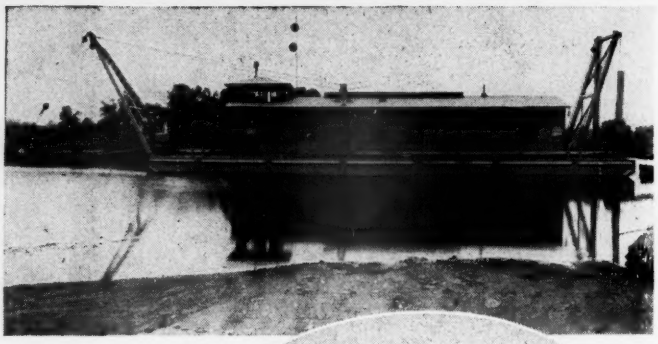

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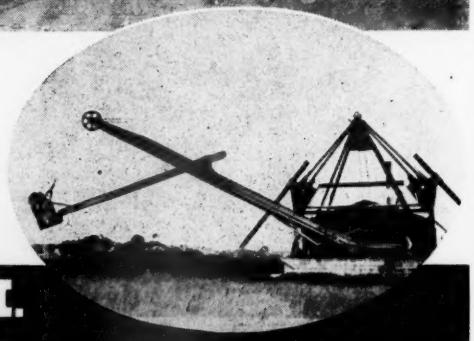

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# The Engineer's Responsibility As a Citizen

*By B. A. SIMMONS*

*of Houston, President of the American Bar Association,* 1944-45, *President of the Texas Bar Association,* 1937-38. *The address following was delivered at the Annual Banquet of the Texas Society of Professional Engineers on the evening of January* 14, 1946, *at Houston, Texas.*

What is the engineer's resonsibility as a citizen? Briefly, it is the same as that of every other citizen: to take an active and intelligent part in community, state, national and now, world-wide affairs. In real estate law we have a quaint doctrine that comes down from an old English case, which doctrine is called, "The Rule in Shelly's Case." In a law school examination one of the students was asked, what was the Rule in Shelley's Case, and he answered, "the rule in Shelley's case is the same as in anybody else's case; equality before the law is the rule in Texas." Well, that is the same rule that applies in the matter of the engineer's responsibility as a citizen.

### Prominent Engineers

Whether the engineers generally have assumed that responsibility could only be determined by a careful check, one by one. Certainly some of the outstanding citizens of this country are, and always have been, engineers. Our first President, who earned the appellation, "Father of his Country," started in life as a civil engineer. He was the only man in our history who so impressed himself upon his fellows that, in being twice elected President of the United States, he received every vote in the electoral college.

The thirtieth President, yet living, was a distinguished mining engineer. His record of public and professional service was outstanding, and he by no means either caused or contributed to the world-wide depression which unfortunately occurred during his tenure of office. Although I belong to the opposite political party, I have the feeling that we treated him like the Hebrews treated the goat, in Leviticus XVI — 21:

"And the Chief Priest lay both his hands upon the head of the live goat, and confessed over him all the iniquities of the children of Israel, and all their transgressions in all their sins, putting them upon the head of the goat and sent him away into the wilderness."

Of course, that is the way we treat some of our officials when we are looking for a scapegoat for our political and economic sins.

Perhaps one way to avoid that would be to prevent the political and economic sins, and that's where you come in. Your statute says that your knowledge of mathematics, of the physical sciences, and of the principles of engineering are to be employed in the public welfare and to safeguard life, health and property.

More and more the men of your profession are participating actively in public affairs, not only in planning and construction, but in administration as well. This is all to the good, for it is in applied science that the modern world claims its superiority to antiquity. It is in the field of mechanical forces that we can claim an advance in civilization. Through inventions and appliances we have developed the five senses beyond the dreams of our forebears. Our seven-league boots are the trains, motors and planes. Whatever the Genii could do with magic, we can do with coal, oil, gas, steam, electricity and explosives. This is the age of science and of mechanism, and of a thousand wonders of sight, sound and movement.

Twenty-five years ago Einstein was asked if man would ever break open the secret of the sun's energy. He replied: "Certainly. Not today; perhaps tomorrow — but I hope it will not come for fifty years. I am afraid the world will not be wise enough to use the power sensibly."

### Engineers Must Be The Teachers

Well, tomorrow is here in half the fifty years. Will the world use its power sensibly? Perhaps. It is more likely to if it has the facts, the implications, and is taught the consequences. And that teaching can best be done by practical and sensible men who are dedicated to truth and who are profoundly interested in the welfare of all mankind.

A while ago I said your responsibility was the same as that of every other citizen. I want to take that back, for I really believe that each man's responsibility is in proportion to his intelligence, education and experience. To whom much has been given, from him much shall be required.

But aside from our special responsibility every citizen has a general obligation to society. With us, government is based upon consent. Ours is a government of law, and its characteristic features are local self-government, states' rights, and a central government of limited powers, checked and balanced against abuse. This

*D. A. Simmons*

*Mr. Simons was born in Galveston; Educated at the University of Texas, where he graduated in law with highest honors. He served as a lieutenant in the U. S. Air Service in World War I. Mr. Simmons has long been active in Bar Association affairs. Served as President of the Houston-Galveston District Bar Association in* 1932-33; *has served the Houston Bar Association as secretary, director, and chairman of its ethics and grievance committee. He was an official advisor to the U. S. delegation at the recent United Nations Conference held in San Francisco, in* 1945.

government was willed to us by our forebears, and men have died, are dying, and will continue to die to protect our rights under it. They did not make this sacrifice that blind partisans, or the selfish, the foolish, or the reckless, might make a mock of free institutions.

### Our Democracy On Trial

If democracy succumbs, it will be due to the fact that the people fail to exercise their powers, including self-restraint. The demagogue, seeking power and place for himself, magnifies the injustices and needs of each group and class, and promises favors in exchange for votes. It would be less immoral and less detrimental to the nation if he paid for the votes with cash, but he finds it cheaper to use promises, to be redeemed, if at all, at the expense of others. The natural tendency is for each individual and group to engage in a mad scramble for special privileges bludgeoned from the public at large by legislative favor. The answer obviously is that political power must be used only for the general welfare, and not for personal or group advantage.

Next to selfishness, I think the main foe of good government is indifference. I have heard it whispered that some engineers were too busy with their own affairs to participate in government. I do not believe that is true. His right to participate in government is certainly one of the most important affairs any citizen can have, and I am sure each one of us is fully conscious of the fact that in this field our group action determines the destiny of all.

Self-government has come to us out of mankind's unceasing struggle thru the centuries. It is a great trust and responsibility. To be worthy of it man must govern himself with dignity, with honor, with humility, with unselfishness.

You and I — every citizen — must participate. It is relatively unimportant whether you are a progressive or a conservative, a Democrat or a Republican, a Mugwump or a Whatnot. The important thing is to actively particip at in the affairs of citizenship. Most of you are probably progressive conservatives.

### Science Is Progressive

You are progressive — as progressive as science. You are conservative — as conservative as the multiplication table. You know that there are fixed natural laws that must be obeyed. You know that every effect must have a cause, and every action must have its consequence. These talents and characteristics are needed in government.

You know that modern civilization was built by work. Its continuance will require more work. The politician thinks it can be done by talk; and the reformer wants to pass a law or tinker with the machinery. You have heard them. Poverty and trouble should be abolished by law. Or, everyone will be happy if we put them in charge of the organization. Everything must be changed. If responsibility is concentrated, it must be dispersed. If it is dispersed, it must be concentrated. If terms of office are short, they must be lengthened. If they are long, they must be shortened. If we have the primary, it should be a convention, or vice versa. But the one that really irritates me is the childish belief that if you take legislative power from the Legislature, judicial power from the courts, and administrative power from the executive, and put it in boards, bureaus and commissions, then everything will be lovely. It's still power, and it needs to be watched as much, and maybe a little more, than when in the hands of ordinary officials where it is checked and balanced.

To make our form of government work well, we need but one change, and that is, a change in attitude in those people who are indifferent to their responsibilities as citizens. When you get this, you get everything: good officials, good government, good laws, I have never known of an instance of abuse of power or corruption in office, nor have I read of one in our history, that was not cleaned up by an aroused citizenry as soon as they knew of it. And, as likely as not, when it was cleaned up, some of them went back to sleep again. Therein lies the difficulty. Democracy is the only form of government which requires the participation of the people, and hence is the most difficult to operate. In a great country like ours it must have a republican form. Therein lies its safety. But it functions only with the support of the good, the wise, and the honest.

Do you know that the Declaration of Independence and the Constitution were set up as standards for the good, the wise, and the honest? The Declaration of Independence, in its concluding paragraph, says:

> "By authority of the *good people* of these Colonies, we solemnly publish and declare, that these United Colonies are, and of right ought to be, free and independent states."

And, when the Convention of 1787 was about to make some dubious compromise to attract support to the Constitution being written, it was that great engineer, George Washington, who said: "Let us erect a standard to which the *Wise* and the *Honest* may repair, and leave the event in the hands of God."

### Competency Imposes Responsibilities

And so, as I know this group is composed of the good, the wise, and the honest, I say you have an absolute obligation to participate actively and continuously in governmental affairs in order that they do not fall into the hands of the bad, the foolish, and the dishonest.

In conclusion, I wish to mention one other attribute that prevents many people from participating in public affairs. That is, fear. Fear that they will lose business, lose position, or make enemies. And so you may. The roll of martyrs is long, indeed and is not yet concluded. And some fear for our state and nation if we take our proper place in the world. To them I quote a poem written in the dark days following the Civil War—days, also, of fear:

"But let our fears, if fears we have,
be still,
And turn us to the future. Could we
climb
Some mighty Alp and view the coming
time,
The rapturous sight would fill our eyes
with happy tears,
Not only for the glories which the years
Shall bring us. Not for lands from sea
to sea,
And wealth and power and peaces,
though these shall be,
But for the distant peoples we shall
bless,
And the hushed murmurs of a world's
distress.

For, to give labor to the poor the whole
sad planet O'er,
To save from war and crime the humblest
door,
Is one among the many ends for which
God makes us great and rich.
The hour, perchance, is not yet wholly
ripe,
When all shall own it, but the type
Whereby we shall be known in every
land,

(*Continued on Page* 4)

# If I Were An Engineer

*The Observations and Reflections of a Non-engineering Educator.*
*By RICHARD R. PRICE, Executive Secretary*
*Minnesota Association of Professional Engineers*

"I hold that it becomes no man to nurse
despair,
But in the teeth of clenched antagonisms,
To follow up the worthiest till he die."
—Tennyson

As a result of experience, observation and reflection, this is the advice I would give to neophyte engineers, middle-aged professionals, engineers-in-training and students preparing for a career in professional engineering. (I make no apology for the liberal use of the first person singular; this is a personal message.)

1. *If I were an engineer,* I would be a good engineer. This does not mean necessarily that I would design and build great central power plants, a Golden Gate Bridge or a Boulder Dam. But it does mean that, within the limits of my congenital capacity, any construction for which I was responsible would be soundly designed, honestly built, functionally efficient and economical of operation; it also means that any underground or concealed members would stand critical inspection in the full light of day, "for the Gods see everywhere". My works should always speak with the loud voice of integrity. To accomplish this I would seek and acquire adequate preparation and training; and I would not be in too much of a hurry to get started on a career.

### Choose Best School

In order to attain this objective I would be determined to attend the best engineering school I could find. The best is none too good as the foundation for a life-long career. At the end of the second year of schooling let the special branch or field of engineering which makes the strongest appeal to the student's taste and aptitudes be chosen. Here the danger of over-specialization is to be avoided. He should be preparing to live, richly and abundantly, as well as to make a living; and the former is by far the more important in the long run.

Therefore the wise student will take only the minimum of required courses in his special field; he will have to live and grow in that area for the rest of his working life. He should fill up the rest of his program with courses in the other specialized fields of engineering. In that way he will acquire a valuable working knowledge of the whole area cultivated and serviced by the engineering profession.

In later days he may be thankful that he has some insight into the problems confronting engineers in collateral branches of his vocation. Above all, I advise that he take a fifth year of work before he leaves school. That may lead him to a Master's degree; but whether it does or not, it is a sound investment that will later pay rich dividends. Let the other fellow get a year's start in a job; in ten years, other things being equal, the difference will be wiped out.

### Acquire Broad Education

2. *If I were an engineer,* I would strive to be an educated man as well as a professional scientist. This means I would try to get as much as I could of the broad background of the liberalizing studies which now seem to be the special prerogative of graduates of the liberal arts colleges. One has to have some understanding of the world in which he lives; one must, in a greater or lesser degree, become a citizen of the universe. The engineer is now a factor, and an important factor, in the social equation. Society asks, nay demands, that he know what the score is. The progress of engineering through all recorded history has been co-ordinated and correlated with the demands of human society.

Behind the present professional facade is a great and significant background of intertwined social relationships. Engineering has always been entangled, for good or evil, with social movements, with the operation of economic laws, with the vagaries of politics and with the theories and conclusions of philosophy. How can one understand things as they are if one is completely ignorant of things as they were? If this be admitted, then an imperative requirement for the prospective engineer is a summary course in the History of Western Civilization, with special emphasis on social and economic developments, art and philosophy. As time admits there should be added courses in sociology, economics, psychology and philosophy.

If one has artistic tastes and aptitudes, they should be indulged; aesthetic development adds to the richness of living. I know several engineers who are competent musicians

*Richard R. Price*

*Mr. Price is a native of Wales. Received his B.A. degree at the University of Kansas, also M.A. degree and Ed.D. at Harvard. Was for many years Director of Extension and Professor at the University of Minnesota. He is the author of numerous books dealing with educational matters. Also has had wide experience in editorial and association work.*

---

### Engineers Responsibility

(*Continued from Page* 3)

Is that vast Gulf which lips our southern
strand,
And, through the cold tempered ocean,
pours
Its genial streams, that far-off Arctic
shores
May sometimes catch upon the softening
breeze
Strange tropic warmths and hints of
summer seas."

And so I say we must overcome indifference, and put away fear, and make the influence of America the force for good our forefathers intended it to be. And, because I know you are going to give your full measure of support to that end—I salute you.

and, doubtless, there are many more who are devotees of the other fine arts. "But," some one asks, "how are you to do all these things and still have time for the rigorous curriculum in engineering?" One answer is the fifth year mentioned above. Another is that at this stage of the student's career only a rudimentary smattering of the subjects mentioned above is desirable or feasible. The rest must be obtained through constant reading and study throughout life. The main idea is to get in school enough of a taste of the subject to whet the appetite for more; thereafter that branch of learning may be pursued at intervals of leisure as an interest collateral with more specifically professional pursuits.

The objective is to develop with maturrity a mellow, well-read and reflective man, whose knowledge and interests are much wider than the technological field of his vocation. Unfortunately, engineers thus equipped are not as numerous as they should be. Thus their value as social agents and their dignity and prestige as members of a learned profession are unduly limited. By standing aside from public affairs engineers have found it difficult to obtain acceptance of the fact that they are truly professional men.

### Social Responsibility

3. *If I were an engineer,* I would afford the luxury of a conscience. I would strive to feel in every undertaking a sense of social and moral responsibility and obligation. Today the engineer's absorption in technical training tends to divorce him from participation in humanity's yearnings and strivings for a nobler social order — an order wherein such virtues as truth, justice, magnanimity and righteousness shall flourish. The goal is conditions favoring a rational life. H. M. Tomlinson, the English essayist, puts the whole matter graphically in the July, 1945, issue of the *Atlantic Monthly.* Speaking of the present catastrophe and social chaos, he says:

> "Pride in man's control of nature overcame what sense of moral responsibility remained with us for the proper use of power. Revolutionary mechanical inventions were let loose into a society unaware of their inherent perils *** We had not the least idea what should govern the purposes of men when they could dodge about the heavens. *** Never before in history has man had such a store of knowledge and so little understanding. He has been satisfied with facts; he has cared little or nothing for the implications of facts and their relationship to a rational life. Immediate profit was all he wanted. The authority of religion, law, literature, and the arts went long ago, usurped by technology. *** The present enterprises of men *** have been directed heedless of a worthy tradition for guidance. They have had no background for reference at all. The only responsibility enterprise he has acknowledged has been to some narrow personal advantage. Life itself has lost its importance."

### Social Studies Needed

Let the engineer note with care and with heart-searching those ominous words, "heedless of a worthy tradition for guidance", and "no background for reference at all". Here in dynamic words is stated the gist of the argument for the inclusion of the social studies and the humanities in the curriculum of the engineer. And here philosophy, apparently alien to the engineer, comes in. Life has fundamental issues and bases which are beyond the scope and the purview of natural science. Man's relation to the universe and his destiny; his hopes, fears and aspirations; the problem of good and evil; the nature of learning and understanding; the definition of a good life; — these are all matters that concern all men, regardless of their vocations.

Let engineers of today take heed of the words of Vitruvius, a Roman architect and engineer of the first century B. C. He wrote the earliest treatise on architecture, and in it he made philosophy, a prerequisite for the architect. It would make him "high-minded, urbane, just, loyal, and without greed; for no true work can be done without good faith and clean hands."

4. *If I were an engineer,* I would make it my prime business to learn to write and speak English well. Somehow the public, justly or unjustly, tends to judge a man's quality by his speech or by his writing. This is especially true of first impressions. That is why it is a matter to be deplored, by educators and the general public alike, that so few college graduates write with ease, with accuracy and with clearness. This defect is by no means unavoidable; a relatively small amount of painstaking will remedy it. This we know because some engineers write and speak well and yet are products of the same curricula as turned out their less accomplished brethren. It is a matter of realizing the importance of this ability and then of assiduous application to the acquisition thereof. It has been done and it can be done by anyone capable of getting through an engineering school.

### Write Simply But Well

When I speak of writing well, I do not mean the ability to produce ornate paragraphs and purple passages. Leave that to literary artists such as Macaulay or Gibbon. I am speaking of straightforward, simple prose composed of sentences that track and that have organic unity. Occasional lapses in spelling are common enough with all of us and can be corrected easily by a competent stenographer or proofreader. But solecisms, involved and intricate arrangements of words, and a multiplicity of dangling phrases and subordinate clauses, — these are the despair of every editor's heart and the cause of acute discomfort to the reader.

The engineer does not need long, ponderous paragraphs full of intermeshing cogwheels of phrases and interlocking directorates of clauses. He writes, not to induce aesthetic pleasure but rather to convey his meaning, easily and clearly. Therefore he should write short sentences, with the words carefully chosen and carefully arranged. Is this too much to ask of an engineer who, in designing machinery, will work patiently for hours to secure a tolerance of a thousandth of an inch? Much of the difficulty may be ascribed to sheer carelessness or indifference. Let it not be forgotten that easy writing often makes hard reading and that easy reading is often the result of hard writing. The thing to avoid is the slovenly, hazy sentence, lacking the sharp outlines of good workmanship. It is better to kill the squirrel with a rifle bullet in the eye than to shoot all over the tree with a shotgun.

### The Spoken Word

Much of what I have just observed about written matter will apply also to speech. It should be noted again that I am not offering advice about Fourth of July orations or commencement addresses. What the engineer will most need in his business is the ability to get his ideas across to small groups of people in such a way that, first of all, he will be heard and understood; and, second, that his audience will be impressed, convinced and

moved to appropriate action. The engineer, in the pursuit of his profession, will find it necessary from time to time to address committees, boards of directors, school boards or groups of legislators. He will do this for the purpose of selling his hearers his ideas or plans about a proposed project or undertaking, — and, incidentally, for the purpose of selling himself as the man to put these plans into effect. He will also occasionally feel impelled to rise at meetings of his fellow professionals to advocate or oppose certain ideas or policies under discussion. In these situations there are always two factors present: what he has to say, and how he says it.

The preparation of what he has to say has already been covered in the advice about writing. But here we must emphasize again the value of short sentences; the spoken word tends to vanish and hearers do not easily carry in mind long sentences. Of course there should be enough variation so that monotony does not ensue. The style should be simple, friendly, conversational. The audience should be impressed by the speaker's candor, sincerity and earnestness. But his argument should have both persuasiveness and cogency. To power and drive should be added coherence: that is, the arguments should have continuity and a logical sequence.

### Voice Bespeaks The Man

The mechanics of speaking should not be overlooked. No speech is effective that is not heard. The speaker should cultivate a clear, resonant voice; he should not mumble or gargle his words. He should pitch his voice at the farthest listener; then those nearer will be sure to hear. Above all, he should learn to open his mouth and project his words with clear articulation. During the past year I have heard more than one admirable argument ruined by faulty delivery. Let the aspiring engineer attain these worthy ends by assiduous practice. Let him speak extemporaneously on every occasion when he has something to say. Thus he will learn to think on his feet, to marshall his thoughts in orderly sequence and to find appropriate words with which to express his ideas. How important ability and skill in the sphere of expression are to the professional status of the engineer may be judged from the following editorial in the *Engineering News-Record* of May 31, 1945:

"Recently at a Congressional hearing in Washington a capable civil engineer holding a responsible position was criticized by the Senator serving as chairman because of the engineer's failure to speak with sufficient vigor to permit all of the small group present to hear. Unfortunately this is no isolated example. It is the rule rather than the exception when engineers appear in public. That fact needs to be recognized by those who complain so bitterly over public apathy toward engineers as a group. Their program directed toward public recognition must begin within the profession itself. Until engineers learn to look upon their own contributions as of such importance as to call for forceful and convincing presentation they cannot expect the public to hold their profession in high esteem."

### Professional Standards

5. *If I were an engineer,* I would always consider myself and conduct myself as a professional man, a member of a learned profession. In that capacity I would carry out my professional obligations and responsibilities with dignity, with integrity and with self respect, mindful at all times of that code of ethics and of professional conduct which has been built up by many generations of honorable men. I would be ever mindful of that rich heritage of principles, procedures, scientific data, formulae and mechanical devices which I have derived from my intellectual ancestors and which now enables me to make my contribution to the service of humanity. As a return for this heritage I would feel myself bound to make some contribution to the accumulated store, so that my successors could start from a higher level. To that end I would join the society of my special branch of engineering and work zealously with my fellows for increased knowledge, more efficient techniques and processes, and a general elevation of standards and qualifications.

In addition, I would feel it my duty to join and to support some overall organization that could speak with authority and with one voice for my profession as a whole. Through such an organization relations with the public, with legislative bodies and with labor unions could be unified and the conflicting interests of all parties could be reconciled.

### Spiritual Values

6. *If I were an engineer,* I would constantly bear in mind the danger of becoming a materialist and I would take effective measures to counteract that tendency. Engineers deal constantly with mathematics, with scientific principles and laws, and with the properties of materials. Their achievements are always produced in terms of tangibles. Hence arises the tendency to put their faith, their trust, their confidence, in *things* — visible, tangible, useful things. There is mortal peril in such a state of mind. There is little doubt that the pagan glory and exultation in power, wealth, machinery, production, construction, which have seized masses of people during the past generation or two, have been at least partially responsible for the grievous plight in which the world now finds itself. This whole trend should be resisted.

It is time that engineers as well as others fall back upon some ancient truths that have not lost their validity. My point may be illustrated by two quotations from a well-known ancient Book of wisdom. One is, "Man shall not live by bread alone". The other is, "For the things which are seen are temporal; but the things which are not seen are eternal". Here we have two scales of value: The structures which man erects and the possessions with which he surrounds himself; and the attributes of the mind and the spirit which ennoble man and raise him above the level of the brute.

It is well for the power-conscious engineer to realize as a chastening and humbling thought that he has brought no power into the world. All the power we now have was always here. The engineer has merely discovered and tapped the sources of power and then devised machinery to utilize it. Adam had the power of falling water if he had known how to use it. The first man that boiled a pot of water had the steam engine in embryo. All the coal and the oil and the gas were there from the beginning; and electricity was everywhere, as it is today. No new power has come into the earth since the beginning; but doubtless there is more to be discovered and utilized. Let man therefore not too highly exalt himself, but in all humility and reverence turn his God-given talents to the furtherance of that "far-off divine event to which the whole creation moves."

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"The point in history at which we stand is full of promise and of grave danger. The world will move either toward unity and widely shared prosperity, or it will move apart into necessarily competing blocs. Which way we move will determine the kind of lives our grandchildren can live."— Franklin D. Roosevelt.

# Principles of Ethics and Practice

*By RAY M. FULLER, Chairman*

*The 1945 Ethics and Practice Committee of the National Society of Professional Engineers*

*Transcript of an address delivered at the 1946 Annual Meeting of the Lehigh Valley Chapter of the Pennsylvania Society of Professional Engineers, at Allentown, Penna.*

What do we mean by Ethics & Practice? All of us know the general meaning and intent, possibly few of you, like myself—until I started to write this—have taken time to see what the dictionary says. And I am afraid many think it only as a punitive action of a strongly entrenched group to further limit the field of their activities.

Suppose before getting into our discussion we exercise our authors license, and utilize the customary cliche of quoting the dictionary. We find—

Ethic: The philosopy of morals.

Ethics: The science of human duty; moral science; the basic principles of right action.

Practice: (among others) To pursue regularly, as a profession.

It seems we might combine these into a single definition, to read: "To pursue regularly, as a profession, a philosophy of morals based on the principles of right action"—which, if you please, brings us back fundamentally to the earliest "Code of Ethics and "Rule of Practice" of which I have any knowledge — the "Ten Commandments" and the "Golden Rule". It is not my purpose to sermonize, but I would add, if all of us were to observe these early precepts of conduct, all other codes, rules, etc., could be thrown into the fire. Unfortunately, we don't.

From the Ten Commandments and the Golden Rule stem all civilization as we think of it. But how little we practice them.

### Controversial Subject

Ethics & Practice in the engineering profession in particular is, and always will be a controversial subject. The ramifications of engineering as a profession are so wide, and ever spreading, and enter so much into all of the daily affairs of such a large segment of humanity, that the delineation of its boundaries is at times difficult.

This boundary difficulty has been one of the inherent troubles in the drafting of registration laws. It is one of the troubles too, in outlining the scope of Ethics & Practice activities. Just where is the dividing line between engineering as a profession, and engineering in commercialism?

*Ray M. Fuller*

It is my belief that we should approach this matter of Ethics & Practice from a practical standpoint. We believe in ideals, but we live in a material world so I believe also in their practical application; and I see no need to compromise our ideals in so doing.

### Competition and Human Nature

We are faced by the hard facts of human nature in a competitive economy. Let us look at some of them.

First—and we reiterate what we have often said and sometimes written —engineers registration laws are placed on the statute books of the various states to exercise the police powers of the state; in the interest of "life, health and the public welfare"—to quote our own. There is no intent to create a profession, either open or closed.

Next, this exercise of the police power is needed not because we want to make engineering into a profession —that is only one of the by-products— but because of the scientific developments of the past century together with the growth of the population, means that the application of these developments in our every day lives in untrained and unskilled hands, potentially affects the "life, health and public welfare" of an ever greater part of our population.

To me, these *facts* are fundamental and basic.

Contributing to the necessity for registration laws and a "Code of Ethics and Practice" to govern, is our competitive economy. It takes a trained mind to determine the proper beam, or truss, or girder, or foundation for a given load condition; whether it be theatre, bridge or other structure. The failure of a main link in a large utility plant or system may endanger numerous lives, or perhaps the health of a whole community; the same as will the failure of a dam, a water supply, a sewage system, or other creative work of the engineer for which he must assume the responsibility of design.

Again, faulty economics in industrial plant design, might, under our competitive system, cause the failure of the company for whom it was built, and affect the welfare of a whole community who are perhaps dependent on it for its livelihood. Its least effect will be felt by the worker in the plant—through his daily wage, and we must remember that a competitive economy is based on profits—else it will not long be competitive or an economy.

### Trained Minds Needed

Therefore the need for the trained mind to achieve the balance between "public welfare" on the one hand, and the "profit" on the other; and the need for "standards of practice" to see that the fidelity to public trust is observed over the pressure of economic gain, whether separate or personal. Therefore the need for "Codes of Ethics", which are now rapidly becoming, in one form or another, a part of the engineering registration and enforcement system, both in the laws and in their administration. And this entirely apart from any question of ideals, or creating a profession.

But to return to the less academic and more practical side of the subject I would like to draw a few illustrations based on practical experience, both as last year's Chairman of the

State Ethics & Practice committee, and to some extent of a time prior to the founding of either the State or National Societies.

It has always been my belief that in subjects for discussion of a controversial nature, to evaluate the speaker's viewpoint, you should know something of his background in relation to the subject. You will therefore have to excuse whatever personal there is in what I have to say.

Some eighteen years ago I entered into private practice. Before that time I had spent quite a few years in the steel industry, and in the employ of large engineering firms. I don't remember that I was ever exposed to a written Code of Ethics, but there were some things you just didn't do—then as now—if you had reasonable integrity, and wanted to hold your job very long. One was—you didn't accept pay from two sources.

One of the first things that impressed me after entering into my own practice was the number of salesmen whose first question after reaching the price stage of the discussion was, "how much do *you* want?" It was not very long until I felt rather ashamed of my profession. But this also partly explains the next illustration, though I believe the blame is on both sides.

### "Free Engineering"

The article from which I quote was from the November 17, 1931 issue of Power Magazine, and was titled "The Cost of Free Engineering".

"Do we ever get anything for nothing? If so, is it the thing we want?

"Awhile back, a manufacturing executive was telling me about the purchase of some new equipment for his plant. He particularly spoke of the generosity of the company which had supplied it, and how it had gratuitously sent engineers down to make a preliminary study of conditions. Although competitive prices were obtained from other firms, he finally bought from this "free engineering" firm at a higher price than that of the lowest bidder, and on an equal-quality basis, because the company had been "so nice."

Skipping some of the intervening paragraphs we quote from the closing ones.

"The question is frequently raised as to how far such engineering by the manufacturer should go in replacing the services of the independent engineer.

"Manufacturers complain that they have to furnish most of the data that engineers use. Why not? They should be specialists in the line of their product, the engineer, and particularly the one in general practice, may or may not be specialized along the same line, as his field is ordinarily much broader. The very multiplicity of materials and equipment with which he has to deal usually precludes this special knowledge. To offset this he does have the broader vision of the problem in hand, and usually in heart, as he is not concerned with one particular piece of equipment but rather the correlation of all parts to the benefit of the whole. He must needs go to the manufacturer for the details, and at times call in the specialist."

There is a good deal more of this article which we would like to quote if our time permitted. Our point in bringing it in here is that it is still one of the big problems that has to be faced, and it has a definite bearing on Ethics and Practice and its enforcement. And we need to do some house cleaning of our own before we step on the other fellow too hard. It is one of those boundaries that we said were so hard to delineate.

We think the problem of "Free Engineering" will tend to solve itself with better enforcement of the registration laws, and with the employment of professional engineers in industry which will be required under the new law if the manufacturer can in any way qualify to practice engineering, and has any desire to do so.

### Some Purging Needed

On our part we must purge from the ranks of professional engineers those who serve two masters. Our "Code of Ethics" and the new law provide for it. It will take moral courage to do this, and in the end we may have to appear against a friend, or a neighbor —but do any of you honestly think we can ever create a profession worthy of the name by just giving lip service?

My first connection with your society was born of desperation during the depression years—complaining to the Federal Trade Commission about a specific instance of unfair competition from a contractor and manufacturers agent, operating across state lines, I was told to appeal to my society because engineering was a profession and not a trade. I wish we could make the Federal Government see it that way some of the time now.

That, gentlemen, is a challenge, and in itself a reason for our Society and its activities—local, state and national; a triad of mutual interest.

One of our greatest problems in Ethics & Practice matters is the frequent, but understandable, unwillingness of, shall I say, ourselves, to make personal complaint against a person or thing we know to be wrong, because of reasons as numerous as human nature.

Last year in connection with an Ethics & Practice matter for one of the Chapters the question was asked, "does my name have to appear?" It was a young man who asked it (there are plenty of older ones who ask the same) and he was told, "No, not at this stage of the matter". But I ask you, why should the Chairman of the State, or even the local Chapter, Ethics & Practice committee be required to assume the onus of the moral responsibility and the ill will that at times it engenders, if the complainant is unwilling to have his name appear in subsequent action? And another question —if we do not have the moral courage to back up our complaint, are we much better than the person against whom we complain?

(I am afraid I am going to make myself unpopular before I finish.)

### "Put It In Writing"

Out of our experience has come this stand—we will not undertake any action that is not put in writing, and is not backed by sufficient evidence to secure results. It is my belief that the investigation and collection of evidence should be done so far as possible, first by the Chapter, and then be referred to the State committee for final action. The reasons for this seem fairly obvious, but we illustrate our point this way—from one Chapter we received a rather bitter complaint against several individuals and firms for practicing without registration. Following our usual custom, we checked with the Registration Board and found that five out of seven were registered. We sent the other two back to the Chapter Ethics & Practice committee for further investigation, evidence and report. To date there has been no reply.

Does not our stand seem reasonable? You know we have to make our living too.

As a result of a casual dinner conversation this past year we have in our files a copy of a letter written to the Advertising Section of the tele-

phone company. It is by a friend, a highly placed engineer who we very greatly admire and respect. May I read it to you?

"For several years I have been running in the ..... Directory a small professional card under the heading 'Engineer-Consulting'. A number of other engineers have been doing the same thing. Under the Codes of Ethics of the various engineering organizations advertising of this sort and even bold face printing of one's name would seem a violation of such codes. Accordingly I am desirous of having the card above referred to withdrawn so that it will not appear in future issues of the directory."

### Pennsylvania's New Law

Our new registration law, to go into effect June 31st of this year, poses for us a good many new problems. Some of the old landmarks are wiped out and new ones will have to be charted. The question of what constitutes the practice of professional engineering is somewhat clearer in the new law in its intent, but the border line is still there.

For the first time in Pennsylvania the law cites as cause for revocation of license the violation of the "Code of Ethics". And we have the promise of the Registration Board to include the Code of Ethics on some part of the application form or card, and to adopt it by resolution into their records. Our attorneys have informed us this will give it legal standing in courts of law.

I wish all the problems were that simple.

To some extent we can be guided by past experience: some extent by the precepts of the older professions of law and medicine, though neither of them are so inextricably mixed with the commercial and economic factors of living as is the engineer. Mostly we are going to have to be guided by lots of common sense, and a program of education for the general public as to what we stand for and what it means to them in safety of "life, health and public welfare".

### Numerous Problems

If I were to try and single out from the host of problems that seem to be taking shape in the not too distant future, the one to first attract the attention of the Ethics & Practice committee would be to further attempt to define the dividing line between what is considered the practice of professional engineering and what engineering practices are not so considered. The change from the old law to the new law regarding the practice of corporations makes this necessary. We hope for a friendly court test case to start to define this line.

We are not, and perhaps I should say I, one of those who subscribe to the belief that the word engineer can be restricted solely to those engineers who are licensed and registered, as much as I might wish it. The word has been in use too long in all of the derivatives of engineering, though lately, at times, its use has been very much corrupted.

We must keep in mind, however, that as a society we do not represent one class of engineers, or group, as against another. We are both employers and employees, and as such we are all bound by the same rules of conduct, by the same Code of Ethics.

In our ranks we have engineers working for the government and its sub-divisions; for the utilities; for industry as designers of manufacturers products and as plant engineers; for contractors and as contractors: and the engineer in private practice.

The employee of a corporation, utility or contractor, whether he be lowly or highly placed, if practicing professional engineering, is as much bound by the "Code of Ethics" and "Rules of Practice" as is the consultig engineer in private practice. If anything, the position of the employee is more difficult by reason of his employment and economic necessity. Yet at times he will have to resist the demands of his employer if he maintains his integrity.

As a society, and a profession, we must back these men up against the employer who would force them into unethical practice and the exercise of bad judgment for the employer's personal gain. This is our duty as a society and we will not long survive as a profession if we do not. It is one of the responsibilities of the Ethics & Practice committee. It is also yours individually.

### If We Would Be Leaders

The title PROFESSIONAL ENGINEER,—if we live up to the tenets of our profession and without hesitation prosecute those who would trespass against it, and purge from our ranks those who would degrade the title—will more and more stand out and above the generally accepted use of which we wish to be—leaders of the the word engineer, and stamp us as that profession.

If we wish to be leaders we must first be good Americans. To guide us and point the way we must from among ourselves choose men of proved integrity to lead us against whom the finger of scorn and mistrust cannot be pointed. In particular your Ethics & Practice committees must meet these qualifications. They must be fair and just; willing to sacrifice some personal time and some gain; and perhaps some friendships for a cause they believe in. There seems to be no easy way.

Appointment to your Ethics & Practice Committee should be deemed a position of trust—a place of high honor.

### Building For Posterity

We are not building for ourselves alone, at least those of my age. Our work is for the future generations. We continually hear it said that we are entering upon a new era. Surely if it is being born the travail is great, and while it does not mark the birth of the engineer at least the necessity of his emerging into full equality of leadership with those others who would rule is greater than it has ever been in the past. The times call for the best leadership that we can produce to help guide the nation into paths of industrial peace here at home, and international peace beyond our borders.

In closing, I am inspired to quote John G. Holland from the Journal of American History:

"God give us men! A time like this demands
Strong minds, great hearts, true faith and ready hands;
Men whom the love of office cannot kill;
Men whom the spoils of office cannot buy;
Men who possess opinions and a will;
Men who have honor; men who will not lie;
Men who can stand before a demagogue
And damn his treacherous flatteries without winking!
Tall men, sun-crowned, who live above the fog
In public duty and in private thinking—
For while the rabble with their time worn creeds,
Their large professions and their little deeds,
Mingle with selfish strife, lo! Freedom weeps,
Wrong rules the land, and waiting justice sleeps!"

# Unity of The Engineering Profession

*By S. L. STOLTE*

*Member of Executive Committee The National Society of Professional Engineers.*

*This is a condensation of an address delivered before the Oklahoma Society of Professional Engineers, at their Annual Meeting in Tulsa, Oklahoma, January* 11, 1946

Anyone deliberating on the subject assigned to me will immediately be impressed with the almost overwhelming conditions in the profession crying for attention if we are to enjoy—even in a small degree—the necessary unity in our profession and, in turn, if we are to properly assume and carry out our responsibilities and service to society.

Of necessity, we should first analyze what conditions are in need of attention, what we are or are not doing about them and what we must do to realize our goal.

It seems to me the following outline of topics bear on our subject or need analysis at this time:

1. Unity of Purpose
2. Unity of Definition
3. Unity of Regulation
4. Unity of Standards
5. Unity of Practice and Ethics
6. Unity of Information for ourselves or Understanding for the public
7. Unity in Representation
8. Unity of Implementation

### A Personal Experience

I might best illustrate the first topic "Unity in Purpose" by my personal experience. I graduated from the engineering school at our university with no clear idea of what was ahead except a personal desire to build buildings. After several years of work in a local office engaged in the practice of architecture and engineering, I was finally invited to attend a meeting of the local Engineers' Club. I looked forward with anticipation to this event and appreciated this opportunity to fraternize with other engineers. The speaker was an excellent authority on heating and ventilating, and I enjoyed the message; but as I looked around the room I recognized many men of my acquaintance, many men in turn who were outstanding engineers in various fields but also men who could only be classed as interested in engineering.

Believe me, I thought very highly of everyone present and enjoyed exchanging greetings and anecdotes with them—but I still felt that this group did not satisfy my longing for a circle of men of my own profession—men who would have a common and understanding interest in the engineering profession as such. The last thing I would want to happen is that any of that group might think that I was high hat or looking down the end of my nose at them—all I had was a genuine desire professionally to join with a group who in fact were engineers so that I might discuss, without keeping my tongue in my cheek, standards of education, practice and experiences or techniques.

*S. L. Stolte*

### Strong, But Not United

I realized more and more that for some reason the profession of engineering had not united its strength as had the other two professions of law and medicine. Still I couldn't feel that my chosen profession was any less noble, any more dispensable or any less needed for the general welfare of society than were the professions of law and medicine. At first thought, it seemed that the last two mentioned professions had the advantage of more personal relationship with the people and generally a more complete control of the relationship with the client than was the case in the engineering profession—but I concluded that this was not so. We had just lulled ourselves into such a belief.

It is true you don't argue with your doctor when your life is at stake, and similarly you trust your lawyer to have the "know how" to get you out when you are in the clutches of the law—but what is more directly personal than the safe water you drink, the properly preserved or prepared food that you eat, the healthy air that you breathe in home and office, the safely controlled heat, the properly built shelter, the adequate sewage disposal and so on? The trouble is we have not been vocal enough regarding our responsibility to and contribution to society.

### Dubious Ethics

And speaking of integrity or the more ethical of professions, this point is best illustrated by an incident recently recounted to me by an attorney friend of mine. He had tried an arson case before a local jury. His defense of his client had been completed, the jury retired and returned shortly with the foreman of the jury announcing the verdict. The defendant thought the foreman had said guilty so he buried his head in his hands and began to moan, "I'll never do it again—I'll never do it again!"—when my friend rushed over to him and said, "Shut up you d—n fool, he said *not guilty!*" Well, he was proud of winning this case. So I said to my attorney friend, "—and you call *that* a noble profession!"

As far as I'm concerned, the lawyer writes off his mistakes in the court records, the doctor buries his mistakes, but the engineer's mistakes stare him in the face forever!—or at least until corrected or removed and only after all the world has pointed a finger at him.

Then as to confidential relationships or trust, surely the engineer must learn of many details of his client's busi-

ness, processes and methods which are as great a trust and if abused would create as great damage as any confidences between lawyer or doctor and client. All that is the matter is we have been hiding our candle under a bushel basket. We have operated as individuals, believing that our works would speak for themselves—but, gentlemen, such recognition is usually too late to be of current value.

The time is past when on overall problems of the profession we can act as individuals. Federal or state legislative bodies or committees are no longer impressed except by numbers. Similarly, private or public activities will lend an attentive ear only when the voice is backed up by members that count, at least a majority of those represented.

### Unity of Definition

Now let's consider for a moment a *unity of definition.* How many of you, when asked, can define a professional engineer? We struggled with the question of such a definition recently when we introduced measures to strengthen our state registration law.

The more I searched for and studied such a definition, the more I was convinced that we should get back to fundamentals. How did we start out on our road to professional engineering?—what were our common denominators? Well, it seemed we all first became versed in the principles of mathematics and the physical sciences and then we applied this knowledge in our respective fields of specialization.

This is, therefore, my definition of a professional engineer:

"A professional engineer is a person educated in the principles of mathematics and the physical sciences who applies this knowledge to direct and control the materials and forces of nature for the safe use and convenience of man."

Have you a better one?—at least this recognizes our beginnings and is similar in approach to that made by medicine, for that profession hung or solidified its future on its basic science law.

We hear much today regarding the atomic bomb. Don't misunderstand the following comments—but can we not be realistic? The scientist discovers the basic law or truth in physics, chemistry or the like—but it is the engineer that *applies* that knowledge for useful purposes for mankind. Many times the scientist is in fact the engineer as well. All I want to clarify is that whenever the principles of mathematics or the physical sciences are *applied* that is when the engineer enters the picture. It is, therefore, the engineering that made the atomic bomb a reality. The scientific truths were known for several decades, but it remained for engineering to develop the "know how" of application and production. Yet, how much do you hear regarding the engineer in connection with the atomic bomb? This only as evidence of our own inarticulateness.

### Legal Definitions

Concluding our discussion of definitions then, we have today state registration laws that define our profession in various ways. In the present Illinois law—and I know in deference to a state Supreme Court decision that declared the former law unconstitutional which in fact followed the Model Law and which nevertheless is the law as it now stands in the State of Georgia and several other states—the Illinois law attempts to define the various branches of engineering, and that of course is an endless job for new ones pop into the picture every so often as illustrated more recently by aeronautics, radar, electronics, radio and the like.

A conference in August, 1945, held in New York, on a Model Law, attended by twelve engineering organizations in the United States and a representative from the Dominion Council of Professional Engineers of Canada, agreed upon a definition of "Professional Engineer" and "Practice of Engineering" and, I believe, you will find that the core of these definitions is the one given above with the one logical addition of, "—as attested by his legal registration as a professional engineer."

We, therefore, still have various definitions in state registration laws, but some progress toward unity of definition is on its way in our own ranks.

### A Series of Unities

*Unity of Regulation* is indicated when we note that today 47 of the states have registration laws. Montana and the District of Columbia are the only areas in the United States not so covered. It is true that the conditions in the laws vary with states, but all are on the first step of the ladder. This is good and a Joint Committee of the National Council of State Boards of Engineering Examiners and the national Society of Professional Engineers are making notable progress in unifying state registration laws and supporting enactment of registration laws in remaining areas not covered.

*Unity of Standards* is being obtained primarily through state registration laws. The generally accepted goal is now that registration laws require a minimum of eight years of training and experience, not less than three of which must be appropriate experience. Our state and numerous others already have the eight year requirement in the law. When all states have a similar minimum requirement, reciprocal registration or registration by endorsement will be greatly facilitated.

*Unity of Practice and Ethics* is reflected by Codes of Ethics and Minimum Fee and Salary Schedules. These two standards and a vigilant policing of adherence to these standards by professional engineers through a strong, unified professional organization will make possible the type of practice we must render the public.

A pertinent thought at this point is that we as a profession should and must not hesitate to pool the knowledge within the profession—let's not hesitate to call in consultants so that the best minds are brought to bear, as needed, on any particular problem.

*Unity of Information or Understanding* for ourselves and the public is basic to our progress. Where the educational progress program lags, we find confusion, stalemates and even vigorous arguments and jealousies within our ranks and a lack of appreciation by the general public. But it takes work, sacrifice and more effort on the part of many and preferably all members of our profession to obtain our goal—and finally it takes money to carry on a continuous full-time publicity and educational program.

As part of our undergraduate training, there should be realized an understanding of the history of engineering and an orientation of what we might expect in present practice. Maybe I am not up to the average—but it was fifteen years after I left school before I realized that in the beginning the engineer was the operator of engines of war. I did not know that the first engineering school in this country was established in 1825 at Troy, New

York, and that only six were established up to the time of the Civil War and four of them were not of a high order.

Real expansion occurred with the establishment of land grant colleges in 1863 and incidentally emphasized the mechanical engineer whereas up to that time we had first the military engineer and then the civil engineer to distinguish him from the military—and so on. We certainly missed the boat in the latter half of the 19th century in not keeping a single overall engineering representation which was then represented by the civil engineer. But first mechanical, then electrical, etc., grew out from under the wing of civil engineering without our maintaining a single voice for the profession, but we operated as individuals or in specialized technical fields.

*Unity in Representation* is clearly illustrated by a condition or recent experience in our state. Quite properly the construction industry representatives became concerned during the war to see to it that we plan for and anticipate post war conditions. It was decided to form a "Construction Planning Committee". Representatives should be present from four evident groups of the construction industry, namely: Contractors, producers or manufacturers, architects and engineers. It was at first thought that two from each of a total of eight was a proper committee. Contractors were immediately represented by the A.C.C.; the material men by the Producers Council—but then confusion set in.

The architects in our state are represented by the Northwest Chapter of the A.I.A., which has, however, excluded from its jurisdiction the St. Paul area where a separate Chapter of A.I.A. exists. Then there also is the Minnesota Association of Architects. Therefore, six architects were named from these three groups. To select a representative engineering group resulted in recognizing the Minnesota Association of Professional Engineers, the Minnesota Federation of Engineering Societies and the Minneapolis and St. Paul Engineers' Clubs—or sixteen instead of eight committee members due to a lack of unity in the architectural and engineering professions!

In such circumstances, interested parties should be able to knock at one door for the engineering profession, and we could then decide if any particular branches should be especially called in.

### The Profession's Structure

As I have so often stated, we might compare our profession to the elements of the tree. The smaller and numerous roots are the members of the profession who, in turn, are attached to the secondary roots—which might be our local or district societies. The primary roots are the state societies. All support the trunk of the tree—a single overall national society. In turn the trunk leads up and out to main branches of our profession—the technical fields or societies.

Our present trouble is that many of the main branches have grown to maturity and now we are trying to insert the trunk and this way cause even a major operation.

Finally, let us consider "Unity in Implementation". If our purpose is clear, it seems to me we should be smart enough to solve the organizational requirements to gain our ends.

### Organizational Structure

We must have an organization rooted in the members with proper flow of authority through the local chapters or districts, then to a state society and finally to a national society. These organizational bonds up or down the line must be complete. We cannot have a week link or the whole chain will break down.

Gentlemen, as one soldier said to another as they were shipping out to sea and standing at the ship's rail: "Did you ever see so much water in all your life?"

Reply: "Brother, you ain't seen nothing yet for that is only the *top* of it!"

—and so I have given only the *top* of our professional engineering problems leading toward unity in our profession. It is only complete support—personal and financial of every professional engineer in the country that will make possible a respectable professional engineering service to society—and incidentally a more satisfying and happy existence for you and me.

# National Issues—Washington Economic and Political Front

To the unitiated, Washington's political picture seems very confused, contradictory and in every way unrealistic. Nothing that you can get hold of seems to make too much sense, and a great deal of what goes on seems utterly fantastic. Some of the evasive, shifty double-talk reminds you of the old Oriental school of diplomacy with its "excuse it please," and "Oh so sorry," all in a decidedly transparent effort at "face-saving."

Despite the universal liking for Mr. Truman personally, almost everyone deplores his ineptness in picking men for key posts in his administration. Apparently the President has been the victim of some very poor counsel. The general pattern of that counsel seems to have been to the effect that what the people wanted was to "get back to normalcy." This has been interpreted in some influential quarters to mean "business as usual" and "politics as usual."

### Business in Government—Not Government in Business

Domestically this has resulted in decisions with reference to such matters as *wage* and *price controls* which are generally agreed are partly responsible for the wave of strikes. There appears to have been a feeling in high policy making circles that "everything will work out all right if it is just let alone." This is the old theory that "the best government is the one that governs least." However, the President's many well-wishers still have hope that he will turn soon to wiser counsellors. So far his critics accuse him of a tendency to give way under business pressures insofar as political expediency permits. However, in the case of his nomination of Messrs. Pauly, Allen and Vardaman, some very shrewd Washington observers feel that "political expediency has been tossed completely overboard," largely on behalf of personal friendships.

The strike situation shows signs of softening up insofar as the major strikes are concerned. It is expected that in most instances "anti-inflationary controls will be thrown to the wolves of industrial peace."

Much of the difficulty in averting

strikes is due, undoubtedly, to the almost universal tendency to distort, if not entirely evade the basic economic factors involved. Perhaps the least helpful comments are those which insist that the interests of labor and management are identical, because both are interested in all-around prosperity and national well being. That is like saying that the "interests of buyer and seller in any transaction are identical." The obvious truth is that every business deal requires a compromise between the clearly conflicting interests of buyer and seller. The same holds true in setting the wages of employees, and in establishing the prices for goods and services that consumers are to pay to producers. Fudging the issues simply makes a peaceful settlement more difficult.

Much has been said and written about the vital necessity of everybody getting back to work and increasing production. The implications usually are aimed at labor's work stoppages. Not enough attention is paid to the fact that producers hold down production very often in order to affect price levels. This is exactly the same thing that labor organizations are doing when they refuse to function, unless given a higher "price" for their services. There is no point to singling out either management or labor for criticism, but in the present world crisis, it is about time we face some of the basic economic truths and act on the basis of a real understanding of these economic relationships. An engineer should be quick to understand how important such "fact finding" is.

In 1945 the government paid subsidies to business enterprise as follows: meat packers $595,000,000; to oil producers, $290,000,000; rubber producers $140,000,000, and to butter producers $100,000,000. Judging by the shortage of these items during most of the year, it can scarcely be said that the system had accomplished all that was expected in the way of stimulating production.

### Labor Legislation

Legislative moves to curb strikes have the appearance of being largely political in motive, as one newspaper man puts it, "making a sucker out of the business lobbyist who pays anyone who will take a crack at labor." The Case bill is gleefully supported by Republicans who feel the Democrats will get blamed by labor voters, while Republican aid for the bill will be applauded by the boys who contribute heavily to campaign funds. Few believe any such legislation has a chance of becoming law.

The great majority of thinking people agree that this country is in a period of *transition,* some kind of fundamental *change.* Yet one of the most obvious facts evident in every one of the political controversies is that the predominant pressures being applied in Washington are *against any fundamental changes* that can be avoided. In short, resistance to change in an admitted period of unavoidable change is probably the key to the widespread confusion which one of America's best known commentators referred to as "a state of political and economic chaos—real or impending." Commenting on this view, and what conceivably can be done to clear things up, an ace newsman recalled a statement by the late Clarence Darrow, made in reference to a similar situation in a mid-western city when he said: "The only hope I see for an eventual solution is in the possibility of a few first-class funerals (political or otherwise.")

One of the most interesting side lights on the peculiarities of our price-value economy is contained in a news item from the American occupation zone in Germany. It appears that at the very time the head of the U. S. Military Government's economic division was telling the four-power control committee that the I. G. Farben industries "exist in name only" in the American zone, and that the plant had been blown up," the stock of the chemical plant rose sharply on the stock exchange.

### When Is A Strike A Strike?

Labor leaders charge producers of textile goods with hoarding supplies in the hope of higher prices. They ask if that isn't a "strike" against consumers. In short neither management or labor seems willing to put forth any outstanding efforts to increase production, unless it first gets its *price.* Labor complains of the critics of its strike policy who condemn work stoppages as undermining the nation's prosperity, while at the same time maintaining that management curtailment of production is just "good business." Probably neither side would welcome any real "fact-finding" effort which might (if not properly "controlled") uncover the "wrong answers" from the standpoint of the "right people."

In a recent address before a meeting of the National Association of Manufacturers, Marion Hargrove, the ex-GI author of "See Here Private Hargrove," told this group of producers that they were acquiring a wide-spread reputation for opposing every single piece of progressive legislation, and of backing, if not initiating every type of reactionary measures.

In Washington during the past few weeks there has arisen an organization of "progressive businessmen" which announces it proposes to voice the views of more progressive businessmen, of whom there are great many in this country, although forming a minority in every trade association. In contrast to the now abandoned businessman's slogan of a few years back, "What's good for business is good for you," this group proclaims, "What's good for the whole American people is good for American business." The executive director of this new group has been one of the regional directors of the Social Security Board for some ten years. This development has special significance in view of the obvious cleavage among members of the older business organizations, one example of which came to light in the recent and ill-fated labor-management conference in Washington.

### Would Engineers Dodge Facts?

Private conversation with those who understand the nature of the pressures and cross pressures muddying up the waters in Washington, shows a concensus in favor a real facting-finding division of government. But no one can be found to take the initiative in such a move. Everybody takes a position like that of the Indian Chief who was told by his Agent that it was illegal for him to have 12 wives, and that he would have to *"tell eleven of them to go."* The Big Chief's muttered reply was, *"You tell um."*

### Responsibility for Employment

The preamble of the "watered-down" version of the Full Employment bill passed by both houses of Congress, states . . . "it is the continuing policy and responsibility of the Federal Government . . . to . . . utilize all its . . . resources . . . to promote maximum *employment, production and purchasing power."* That's the essence of a 100 word sentence. Commenting on this statement of proposed Federal policy, a wise-cracking newspaper man says: "Sounds communistic to me — what in heck is there left for private enterprise to promote?

# Teaching the Facts Of Professional Engineering Life

By E. A. HOLBROOK,

*Dean, School of Engineering and Mines, University of Pittsburgh*

(*Reprinted in The American Engineer by Permission, from the Journal of Engineering Education*).

In the so-called Victorian Era, parents were so modest that they hesitated to tell their children the facts of life. Possibly a like modesty restrains present day engineering deans and professors from informing their undergraduates about two paramount facts relating to the young engineers' future professional life. These facts are as follows:

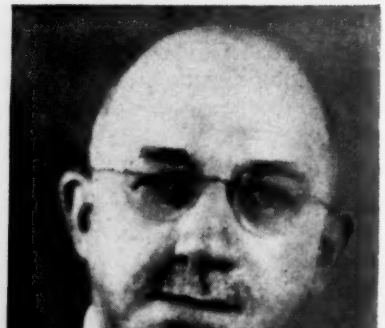
1. Under the Wagner National Labor Relations Act of 1935, now the law of this country, and as interpreted by the National Labor Relations Baord, engineers in many capacities and levels of attainment face a lifetime of labor union affiliation or membership. This law is not a temporary war regulation, and it remains in force until and if changed by Congress.

2. The laws of forty-seven states at present require certification and registration of engineers before they may practice the profession of engineering in the particular state.

### Closely Related Facts

It appears that these two facts are closely related; that they are permanent conditions that will vitally affect this and every future generation of engineers, and that every graduate should be informed on how and where they will help or hinder him in his quest for professional success. If we of the colleges are concerned with preparing men for life, knowledge of these two realities may be of more technical value to them than the details of any single engineering subject, and of more cultural value than any particular non-technical elective of the undergraduate course.

We who are engaged in teaching embryo engineers have been strangely silent and even ignorant of the great forces at work which are making unionism and professionalism part and parcel of the working life of every engineering graduate. Recently I heard competent engineering teachers and even prominent engineering graduates belittle the dangers of unionism by statements to the effect that it did no harm



*E. A. Holbrook*

for a young engineer to join a union, that when he ceased to be an apprentice, the engineer would be beyond the labor union stage, and that the experience would have been good for him.

In the same vein many engineering professors have told me loftily that they were against state registration of engineers, that they were not registered themselves and did not intend to register. Let us look more deeply into the facts as they face us in 1945 and in every future year. Let us forget our boasted independence of 1925 when we thought we were able to face professional life under our own steam, and without brakes or blockades.

### The Labor Relations Act

(1) What are you telling the engineering student about the National Labor Relations Act? Do you tell him that, in all industrial positions he may accept after graduation, he may be compelled to join a union and thereby lose many of the ethical freedoms that you have taught him were his right by reason of his training and education? Do you tell him that even though he be able, industrious and ambitious, his progress in many industrial corporations will be governed by the seniority rules of the union? Do you tell him that the Labor Board's definition of "professional" and "technical" may not coincide with yours and his, and that he may have to continue in the union even though he be doing work of a high scientific and technical nature? Today, legalized unionism goes far above the apprentice stage, and even full membership in a National society will not protect an engineer from union control.* Do you tell him how he can take steps to get into the "appropriate unit" in his collective bargaining agency, and how he can be protected from discrimination on the part of employers if he exercises his right to enter a union or a collective bargaining unit?

### Individualism Doesn't Protect

Do you tell him that his "appropriate" unit may be decided for him and that, as a graduate engineer, he may find himself included in the bargaining group which includes engineers, laboratory helpers, clerks, and janitors? Do you tell him that if he tries to remain an independent technical worker, he may no longer have an opportunity for advancement in American industry and, indeed, may be denied employment? Certainly, if he tries to remain individualistic, there is little protection from discrimination either from the company or from the "appropriate bargaining unit."

It is noteworthy that the National Labor Relations Board is admittedly biased in favor of the organized worker, and that their findings are not subject to a court review. It is true that an engineering graduate who has entered a bargaining unit, either with his professional co-workers, or in some heterogeneous unit, may hereby improve his monthly salary pay check; whether by

** Note: In a recent case, a consulting chemical engineer was forced to join a union before he could enter the company plant to undertake professional examination.*

this action he improves his professional future and his professional ideals is quite another question. How are you going to advise your graduates?

That the union question is not some passing attack on technical men or a question of interest only to the low grade underpaid recent engineering graduate, I brief the following from the Chicago Daily Tribune, January 20, 1944:

### "Technical Experts Strike in Ford Plants"

The article details that 650 technical men at Ford's Rouge plant went on strike. The scientists included engineers, chemists, metallurgists, and physicists who test metals and supervise the treatment and alloying of the metals used by the company. The demand of the union was that all research work be done by union members with wage increases and a pay demand for their lunch period! How the research ideals and professional loyalty we engineering teachers have been trying to instill into our students for generations can be synchronized with a clock punching, ambition excluding group of scientific and engineering introverts, is beyond me. How are you going to advise your students for this new world?

To engineering teachers interested in knowing what your graduates will face in industry, I advise that you read an excellent new book on the subject called *Technologists' Stake in the Wagner Act* published in 1944 by the American Association of Engineers, 8 South Michigan Avenue, Chicago 3, Illinois.

(2) What are you advising your students about becoming registered professional engineers?

Some twenty years ago I took part in a movement to have a recently enacted State of Pennsylvania professional engineers registration act declared unconstitutional. Many of the engineering greats and near-greats of the time applauded loudly. Hardly had the excitement died down when out of somewhere came a great new force putting through the Legislature a new engineers' licensing act which did stand the test of courts. I investigated and found the backers of the act were the rank and file of the engineers of the state. They were the great average engineering graduates of your school and mine. They were employed by cities and state, by small industrial concerns, and also included men who were engaged in the individual practice of our profession.

### Engineers Failed to Cooperate

Not a single engineering professor had helped the movement, most of the National engineering societies had ignored it, and many industrial concerns employing engineering graduates were passive or even opposed so far as their engineering staff was concerned. All sorts of reasons were put forth against this legal recognition of engineers, ranging from a fanciful opposition to regimentation, to the plea that an engineer was not, after all, a professional man in the same sense as a lawyer or a doctor, but only a glorified mechanic.

Then and there I decided that the professional engineer could not just stand still and tell the changing world to keep its hands off. We older men have seen the improvement in the practice and ethics of the medical and legal profession which had come about through their registration and licensing acts. If we, as engineers, are ever to obtain public recognition, and respect, and influence, it must be through state accreditment and licensing. If our ethics are ever to have binding power, it must come from a common legalized unit.

### Professional Standing Vital

I ask that the engineering teachers in our colleges inform themselves and their students that a graduate engineer may be out of luck if he goes to a foreign country to work without legal professional standing. Most foreign countries, including Canada, have a rigid and advanced system governing licensing of engineers. Indeed, Canada and Canadian engineers have accepted wholeheartedly in theory and practice the examination, registration, and induction of men into the circle of professional engineers. Tell the students what standing engineers registered or not registered in your state have when they engage in work in another state.

It is true in some of the forty-seven states now having registration and laws governing the practice of engineering, there are poor and weak laws with many loopholes, and some states have laws providing for the registration of only those engineers who are engaged in a special kind of work.

On the other hand, New York and Ohio have engineers' registration and licensing laws that ought to be a source of pride to every engineer in those states. Only recently, Pennsylvania has entered the company of these two states by passing a revised registration and licensing law requiring written examination and other qualifications to be met by every person who announces himself as an engineer. The registration acts of the so-called model law of these three states agree closely and provide fully for placing engineering on a professional basis comparable with medicine or law. In particular, these model laws bring out the significant fact that the practice of engineering is an individual attainment, and that so-called engineering firms or corporations not made up of individually registered professional engineers may not be legally qualified to undertake engineering there.

### Unregistered Teachers

Certainly, you would not send your son to a medical or law school which was not staffed by registered doctors or lawyers. In the same way, I look forward to the time when the public will expect the professors in our engineering schools to have not only academic titles, but also that of a registered professional engineer. I hope every engineering school will urge its professors to secure a state certificate of registration.

An interesting point for engineering educators to consider is that the laws of the above states make provision for the classification of the young graduate as an "Engineer in Training." Other states, as Iowa, Georgia, Minnesota and Missouri, have or shortly will have the same plan in force. Tell your seniors that if they are going to work in these important industrial states, they should immediately take the state written examination for the satus of "Engineer in Training." This examination covers the theoretical engineering subjects the student was supposed to learn under you. If passed, it exempts him, when he applies for his professional license a few years later, from having to take a written examination on those subjects, in which he may be rusty. Possibly in the near future, the ability of your graduate to pass these "Engineer in Training" examinations may be a fair measure of the kind of training you have given him.

To engineering teachers who have neglected or are not qualified to obtain a professional license, let me say that it is now illegal in the three states men-

tioned to call yourself or to hold yourself by any announcement to be qualified as an engineer, or to engage in engineering work of a professional nature. In a court case, engineering work by a nonregistered engineer would have no legal standing.

### Which Road Professionals?

All of this you may not like, but today your graduates go out from college headed either into professional engineering or into a lifetime of trade unions. We are all together headed toward a unified profession or toward a skilled craftsmanship. We can't continue to stand in the eddy; it is our duty to so advise our young men.

Personally, it is distasteful to think of the men we are training technically for leaders, ethically for high responsibility, and socially for an individual life, grabbing at the easy way of making a living through collective bargaining, mass leadership and rules that stress seniority rather than ability. Let us rather meet our responsibility as engineering teachers by helping in the efforts of our practicing colleagues to pass and enforce laws in our respective states governing who may practice engineering and prevent the incompetent and unworthy from lowering our estate in the eyes of the public and of the government services. In particular, let us back the efforts of our state Boards of Engineering Examiners in their efforts to produce a profession of decent professional and ethical standards. Be an example to your students by being yourself a registered engineer. Perhaps most important of all, acquaint your graduates with the provisions now in effect in some states, and soon to be in others, that by becoming "Engineer in Training" they put themselves in the line that leads away from trade unionism toward the goal they must reach—that of a registered professional engineer.

### Legal Standing Coming

Admittedly at present, there is no clear-cut decision of the Labor Relations Board that would definitely exclude an "Engineer in Training" or a registered professional engineer from being required under some circumstances to join a union. There is, however, every reason to hope that when we become legally established and recognized as a profession, we may expect the same legal treatment as accorded doctors and lawyers, if we are engaged in an actual professional capacity.

There are many definitions of an engineer that you may give your students; the one I like best and offer for your consideration is that "An engineer is a man who has been legally qualified to practice the profession by the laws of his state." With this as a goal, all petty definitions as to kind of work or as to duties and responsibilities, and all admonitions on how the engineering graduate should conduct himself, are trite. A competent graduate will become truly a professional engineer if we point out this way to him.

## Remember These Dates

March. 15-16—New Jersey State Annual Convention, Newark.

March 29—Meeting NSPE Board of Directors, Columbus, Ohio.

March 30—NSPE Conference of State Presidents, Columbus, Ohio.

March 31—NSPE Executive Committee Meeting, Columbus, Ohio.

Oct. 27, NSPE, Board of Directors Meeting, St. Louis.

Oct. 28—Joint meeting of NSPE Board of Directors and NCSBEE Board of Directors, St. Louis.

Dec. 6—Third Annual Meeting, Ga., SPE, Atlanta, Ga.

Dec. 6—NSPE Board Meeting, Atlanta-Biltmore Hotel, Atlanta, Ga.

Dec. 7—NSPE Annual Meeting, Atlanta-Biltmore Hotel, Atlanta, Ga.

NOTE: Please keep the Editor of the American Engineer informed of all planned State Society meetings, with any available advance information as to speakers and their subjects. When any National Officer is scheduled to speak anywhere in your State, let us have the details as early as possible.

It is our present policy to print as much State and Chapter news as space will permit, provided the items have some National interest. This includes news about State or Chapter membership activities, meetings at which prominent speakers appear, and of course any expressions by engineers relating to the policies of the NSPE, the need for an overall engineering organization and any other constructive comment which will contribute to the organizational thinking of our readers in all localities.

At present our closing date is the 5th of the month for the month previous to date of issue. The cooperation of publicity Chairmen and others is keenly appreciated, by the Editor.

## A QUESTION OF SEMANTICS

In the early days of the automobile there was a very nasty mud hole in the highway directly in front of a farmer's home. At first he used to sympathize with travelers who got stuck and would haul them out for nothing. But soon he began to charge for the service in order to meet expenses and overhead.

Before long he was able to quit working his farm and devote himself to pulling people out of his mud hole. Then came a dry season and his income dropped to zero. So he took to hauling water from the pond after dark to keep the mud hole in income-producing condition. We're wondering whether you'd call him a racketeer, or just a shrewd businessman?

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"Gadgets and machines are getting better and better, and man is getting worse and worse." This is the thought of a scientist who has devoted most of his life to research on the improvement of human stock. Engineers should take note, and possibly also take courage, from the fact that it is in the field in which technology has been allowed to function, that marked improvement has come. In the field of social science, from which the Scientific Method has been excluded, the record is a blot on human intelligence. Need anyone point up a moral to this situation?

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Authorities differ on the question whether "human nature" can be changed. The real issue, it seems, should be "can human behavior be changed," as it must be, if civilization is to continue. Dr. Earnest A. Hooton of Harvard, puts it this way: "Clearly, the present level of human behavior is so low that man is more likely to use control of unlimited natural forces for destruction rather than for constructive purposes." The record shows, however, that engineer-built devices have markedly changed human behavor, as political devices have not. It is time technologists got busy on this most important of all problems.

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More progress in the art of utilizing the forces of nature to man's uses has been made since the year 1800 than during all the previous 7,000 years of human history. And most of this change in America has come in the past 30 years—the rate is rapid accelerating. If that keeps up for another 50 or 100 years, what will it do to our traditional way of thinking and living?

# EDITORIALS

## A Plea For "Terminological Exactitude"

The late President F. D. Roosevelt once expressed his concern that our cherished 'Liberty' might become *'just a word.'* The unfortunate fact is that many of our most vital concepts, expressing our highest aspirations and ideals, are often used carelessly, without conveying much of an idea — literally just *'words.'*

We talk of our basic right to be "free", as a nation, in business or as citizens, while failing to realize that 100 percent freedom is practically impossible in any social situation. In the center of a 10-acre lot we are, of course, 'free' to drive an automobile in any way our fancy may dictate. But when that same piece of private property' is being driven downtown, we have to realize that our freedom is sharply restricted — for the benefit of the social situation of which we are a part. Such restrictions are necessary, and although we are frequently irked by them, we realize that full individual freedom in a complex society means anarchy and chaos.

Engineers have a type of training and follow a profession which causes them to use words with some degree of exactness and to give them specific meanings. Politicians and economists are in the habit of muddying the waters by a befuddled use of terms and of statistics for the purpose of putting over a point. Such misstatements by an engineer on the job could prevent a solution. A surveyor cannot make his traverse check by fudging his notes. The scientific mind realizes the futility of trying to deceive physical apparatus or juggle the facts. The engineer must constantly ask himself, "Am I using a method prescribed by the facts," not "Can I get by with it."

Thinking men are beginning to see that the techniques of science must be carried over into the field of social engineering, which in this modern era is closely related to industrial engineering.

More and more must engineers, with social idealism and a sense of humor, be put in policy-making government posts.

## The Engineers Rendezvous With Destiny

Engineers are, because of the type of functional competence their training them, especially qualified to evaluate the current conflicting ideas of just what factors contribute substantially to an economy of abundance in America.

Startling in its implications, therefore, is the fact that very few men of Professional Engineering training, have contributed much to public enlightenment on how best to solve our American political and economic problems. Probably few engineers have delved far enough into such matters to discover for themselves that the *nature of these problems is.* Are they within the field of scope which is that of engineering competence—the field of technology—of the Scientific Method?

The moment a man of engineering training pokes his technological nose deeply into the current political and economic problems of the day, he must be impressed by the abandon with which economists, politicians, and public relations men (representing business interests) misrepresent and misstate the issues.

### How Much Freedom

Much of the misstatement of fact centers around misconceptions of the nature, kind and extent of this thing we call "freedom." Do engineers agree that, in a nation of 140 million people, utilizing more than a billion horse power of prime movers in producing and distributing our goods and services, any individual or organization can possess "freedom" in the absolute sense?

Is any individual or corporate entity free, for example, in New York City or Pittsburgh, when five or six thousand strategically placed union workmen can tie up these cities, even for a day or two? Can business enterprise be called "free' when its pay schedules, its prices, as well as the manner in which it produces and distributes its commodities is restricted by hundreds of legal regulations?

Is any branch of government "free" while under heavy economic and political pressure from scores of potent influences? Is any individual "free," when his job, or his opportunity to earn a living is dependent on how discretely he guards his tongue in public—or possibly on whether he "conforms" generally to the "common denominator" of public opinion?

### Engineers Define Terms

No! If any qualified Professional Engineers were attempting to guide the thinking of the American people on public questions, he would have to make abundantly clear that the basic freedoms of all Americans are in many ways drastically restricted—*unavoidably and in the public interest.*

This is not to say that all the present curtailment of our individual and corporate freedoms are necessary, or always in the public interest. Often they are instituted by or behalf of greedy or at least short-sighted special interests.

We hear a great deal now-a-days about the importance of maintaining "free enterprise." We feel that such terms need definition. They need qualification, for all freedom in a complex social situation is relative, and can never be more than partial. An Engineer, if he had to use such terms would define their exact meaning as used.

What is an "enterprise," a "business enterprise"? We have heard labor leaders berate the institution of business enterprise, forgetting that a labor union is a business enterprise quite as much as is an organization marketing any other type of commodity.

### Freedom To Do What?

Again, there are certain types of "freedom" which are not in anybody's interest. Would an engineering type in mind sanction the type of freedom in America which, involves for example the marketing of goods, services or securities under false pretenses? Would that type of mind uphold the freedom of the press to color, distort, manufacture or suppress the vital facts in the news?

Our point is not to argue either for or against any type of "freedom," but rather to point out the urgent need of what some of the officers of the National Society of Professional Engineers have termed the "engineering approach". We ask our readers thoughtful consideration of the issues involved.

Some one has suggested that "Engineers cannot resign from the human

race." In other words, just because professional engineers have special competence in the field of technology, this does not justify them in avoiding all active interest in and participation in the common human, social problems of government and of economic life. Indeed, by reason of their highly specialized training, professional engineers have a special obligation to the society of which they are a part, to share their functional competence with their less fortunate fellows.

### "Soon" — May Be Too Late

All this seems particularly timely in this period of world crisis. Professional engineers may prefer to inhabit isolated "ivory towers," away from the incoherent chatter of the political and economic vagaries of the rabble. They may feel out of place in the emotionally charged psychology of the mob. That attitude is understandable. But it is unworthy of that rationality, that realistic approach which is the very essence of the engineering competence. The truth is, that if civilization falls in America, it will fall because of the irrationality and the incoherancies of the "Lum and Abner" type of political leadership which is all too commonly found in policy-making positions of government and business.

The Professional Engineer is "all in the same boat" with the rank and file American. To save himself, his family and his posterity, he must contribute of his talent, his training and his scientific approach, that the best in our American civilization may survive and progress to still higher levels of achievement.

No better instrument for implementing such an ideal by the Professional Engineer can be found than an active membership in the NSPE.

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## Government Competition For Materials

Every day brings increased evidence of the danger of conflict between private and government sponsored postwar construction projects. In the December 13th ENGINEERING NEWS-RECORD, editorial comment is in part as follows: " . . . Too many plans for postponable public works are being advanced actively just as if there was no scarcity of men and materials for badly needed construction, such as housing.

"Preparation of a big postwar program was advocated during the war period as a means for providing employment, should widespread unemployment develop. Unemployment has not developed, but many public agencies are going right ahead with plans to put their work under contract regardless of the need for the particular project.

"This is not to say that much of the public work is not needed, for it is. But there are flood-control projects, irrigation schemes, and some highways and parkways that can wait until men and materials are more plentiful . . . "

The bottle necks of this nature exist probably in a number of fields in addition to that of construction. It would seem that some agency, either public or private, might perform a badly needed service, if it could keep the spotlight of pitiless publicity on the bottle necks of scarce materials and supplies which, if the condition is not quickly corrected, is going to hold up any high level of production in dozens of fields. If the scarcity situation is due to slack production in anticipation of higher prices later, there ought to be a quick investigation and prompt action to step up the volume of output. If the idea becomes general that we are living in a "planned scarcity", the public reaction may not, be healthy for those interests involved.

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## Engineers As The Nation's Fact Finders

One way in which Professional Engineers could be of vast service to their country would be in the capacity of "Fact Finders" for the government. This is a function desperately needing to be performed. It should, in the opinion of well informed Washington observers, be a separate department of government, headed by a man forming a part of the President's cabinet.

That department ought to dig up and verify the facts with reference to scores of questions which could form the basis of our national policy in relation to such matters as taxes, wages, prices, foreign trade, loans, employment, distribution of buying power etc., etc. To be of any real value this department would need to be free from the usual pressures to cover up unpleasant facts. It might even find it necessary to publish its own findings to prevent the suppression of such facts.

What is needed are essential facts, unvarnished and uncensored, upon which an informed public opinion could be based safely. As things now stand, practically all the information available to the public on economic and political issues, is prepared and published on behalf of pressure groups with a hidden economic axe to grind. Some government agencies are looked upon in some quarters as just "fronts" for certain business or ideological interests.

This fact-finding job is definitely one for engineers — professional industrial and research engineers. No political set-up would or could do this job as it should be done.

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## Railroad Service, Then and Now—

The Association of American Railroads makes a comparison of the performance of the nation's railways as privately operated in 1944, as against the government's handling in 1918:

"In 1918 the railroads performed 405 billion ton-miles of freight service.

42 billion miles of passenger service in 1918.

Freight rates were raised approximately 25 per cent.

The government took over the operation of the railroads.

Deficits resulting from Federal operation cost the taxpayers two million dollars a day."

### The 1944 Record

"In 1944 the railroads performed 737 billion ton-miles of freight service.

95 billion miles of passenger service in 1944.

Freight rates remain substantially the same as they were before the war.

The railroads have remained under their own management.

Railroads are paying more than four million dollars a day in Federal taxes —to say nothing of their state and local taxes."

This is a record of which railway management may well be proud. However, for the sake of the record, it should be remembered that the government took over the control of the railroad lines in World War No. I, as an absolute military necessity. The service at that time had broken down completely under private management. The cost to the tax payers was excessive, due to reasons generally conceded to be not all the fault of government.

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|---|---|---|---|
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| CONNECTICUT | LEWIS C. SMITH<br>North Haven, Conn. | ROBERT A. CASTRO<br>183 Brewery Street<br>New Haven, Conn. | JOHN W. SHALLENBERGER<br>886 Main St.<br>Bridgeport, Conn. |
| D. C. | FREDERICK W. HILL<br>6440 Barnaby St., N.W.<br>Washington, D. C. | MAJ. ELMER C. KAUTT<br>1033 Patrick Henry Dr.<br>Arlington, Va. | HERMAN F. LAME<br>Westchester Apts.<br>Washington, D. C. |
| GEORGIA | CARL W. EVANS<br>1020 Grant Building<br>Atlanta, Ga. | RAY L. SWEIGERT<br>Georgia School of Technology<br>Atlanta, Georgia | ROY S. KING<br>Georgia School of Technology<br>Atlanta, Georgia |
| ILLINOIS | GEO. H. ANDERSON<br>Annex Building<br>Herrin, Ill. | H. E. BABBITT<br>204 Engineering Hall<br>Urbana, Ill. | W. A. OLIVER<br>201 Engineering Hall<br>Urbana, Ill. |
| INDIANA | M. W. CAMERON<br>3632 Guilford Ave.<br>Indianapolis, Indiana | L. M. CONDREY, Ex. Sec.<br>3436 North Temple Avenue<br>Indianapolis, Indiana | BEN H. PETTY<br>707 Crestview Place<br>West Lafayette, Ind. |
| KANSAS | MOLOY QUINN<br>Clay Center<br>Kansas | HAROLD H. MUNGER<br>Kansas State College<br>Box E Manhattan, Kansas | C. H. SCHOLER<br>Kansas State College<br>Manhattan, Kansas |
| MARYLAND | CHARLES A. MOHR<br>1716 Windemere Ave.<br>Baltimore, Md. | ROBERT ANDREW NORRIS<br>Springfield State Hospital<br>Sykesville, Md. | RUSSELL B. ALLEN<br>4610 Hartwick Rd.<br>College Park, Md. |
| MASSACHUSETTS | WILLIAM F. RYAN<br>Stone & Webster Co.<br>49 Federal Street, Boston, Mass. | ALVIN S. MANCIB<br>P.O. Box 53<br>West Somerville, Mass. | RAYMOND C. NEWTON<br>Babson Park 57<br>Massachusetts |
| MINNESOTA | H. E. McWETHY<br>1, S. 11th Street<br>Minneapolis, Minn. | RICHARD R. PRICE, Ex. Sec.<br>1010 Guardian Building<br>Saint Paul 1, Minnesota | S. L. STOLTE<br>1437 Marshall Avenue<br>Saint Paul 4, Minnesota<br>HIBBERT HILL<br>4512 Wooddale Ave.<br>Minneapolis, Minn. |
| MISSOURI | C. G. ROUSH<br>101 W. 11th St.<br>Kansas City 6, Mo. | H. J. BRUEGGING<br>P. O. Box 365<br>Jefferson City, Mo. | BRUCE WILLIAMS<br>P.O. Box 264<br>Joplin, Mo. |
| NEW JERSEY | DANIEL M. KRAMER<br>107 So. Gerard Street<br>Woodbury, N. J. | FREDERICK D. BRAUN<br>27½ No. Mass. Ave.<br>Atlantic City, N. J. | HUGH C. CLARKE<br>97 Bentley Ave.<br>Jersey City, N. J.<br>C. GEORGE KRUEGER<br>85 Van Reypen St.<br>Jersey City, N. J.<br>JOS. M. CERRETA<br>163 W. Colfax Ave.<br>Roselle Park, N. J. |
| NEW YORK | JOS. A. BRADY<br>39 Osborne St.<br>White Plains, N. Y. | ERNEST F. FOX<br>1941 Grand Cent. Term.<br>New York, N. Y. | WM. H. LARKIN<br>c/o B. F. Sturtevant Co.<br>420 Lexington Ave., N. Y.<br>LELAND R. POST<br>% N. Y. Tel. Co.<br>Binghamton, N. Y |
| OHIO | A. C. NEFF<br>218 Auditorium Bldg.<br>Cleveland, Ohio | LLOYD A. CHACEY, Ex. Sec.<br>63 South High Street<br>Columbus, Ohio | J. S. KENNEDY<br>2945 Lee Road<br>Shaker Heights, Ohio |
| OKLAHOMA | C. S. WORLEY<br>410 Commerce Exchange Bldg.<br>Oklahoma City, Oklahoma | ROGER L. FLANDERS<br>410 Commerce Exchange Bldg.<br>Okla. City, Okla. | CHARLES S. LARKEY<br>Box 521<br>Tulsa 2, Oklahoma |
| PENNSYLVANIA | LeROY F. CHRISTMAN<br>101 Endlich Ave., Mt. Penn<br>Reading, Penna. | RUSSELL S. CONRAD<br>29 S. 3rd St.<br>Harrisburg, Pa. | J. J. PAINE<br>1430 N. Euclid Ave.<br>Pittsburgh 6, Pa.<br>LeROY F. CHRISTMAN<br>101 Endlich Ave., Mt. Penn.<br>Reading, Penna.<br>RAY M. FULLER<br>560 No. 16th St.<br>Philadelphia, Pa. |
| RHODE ISLAND | CHAS. E. BLAIS<br>185 Princeton Avenue<br>Providence, R. I. | VINCENT DiMASE<br>201 Dean Street<br>Providence, Rhode Island | DANIEL C. CARGILL<br>Box 257, RFD 2<br>Valley Falls, R. I. |
| TEXAS | JAMES P. EXUM<br>704 Texas Avenue<br>Austin, Texas | R. S. GUINN<br>504 Ewell Nalle Bldg.<br>Austin, Texas | W. M. ANDREWS<br>Union Nat. Bk. Bldg.<br>Houston, Texas<br>HARRY K. RUPP,<br>c/o Penna. Shipyards<br>Beaumont, Texas<br>ROBERT COLTHARP<br>401 E. 31st Street<br>Austin, Texas |
| VIRGINIA | C. GRADY CATES<br>417 Arlington Rd.<br>Roanoke, Va. | C. G. MASSIE<br>4030 Fort Drive<br>Lynchburg, Va. | J. FRANCIS SETTE<br>4701 Connecticut Ave., N. W.<br>Washington, D. C. |
| WASHINGTON | WALTER L. RICHARDSON<br>1430 — 11th Avenue W<br>Seattle, Washington | MERLIN E. CUSTER<br>1331 3rd Ave. Bldg.<br>Seattle, Wash. | JOSEPH E. WICKSTROM<br>761 Empire Building<br>Seattle, Wash. |
| WEST VIRGINIA | P. K. PIERPONT<br>712 College Ave.<br>Bluefield, W. Va. | ROSS B. JOHNSTON, Ex. Sec.<br>Kanawha Hotel<br>Charleston, W. Va. | T. J. JACKSON<br>1203 Augusta St.<br>Bluefield, West Virginia |
| WISCONSIN | EDWIN W. SEEGER<br>P. O. Box 464<br>Milwaukee 1, Wis. | O. J. MUEGGE<br>656 Crandall St.<br>Madison 5, Wisconsin | L. E. PETERSON<br>312 E. Wisconsin Ave.<br>Milwaukee, Wisconsin |

**Kindly report any errors or omissions to the Editor.**

# National and State Society News

## The Executive Committee of the N.S.P.E. Meets in Washington

The Executive Committee of the National Society of Professional Engineers, met in Washington, D. C., on February 9th, with all members present. When President Ritchie Lawrie, Jr., called the meeting to order at nine o'clock Saturday morning, he presented the group with a very heavy agenda of important business to be disposed of.

After hearing a brief report of Mr. Lawrie's numerous trips and meetings attended, the Committee received the Treasurer's report. On hand in the bank as of January 1, 1946, the report shows $3,040.36. Receipts since Jan. 1st, 5,875.65, making the total receipts of $8,916.01. Withdrawals since the first of the year, to the close of business February 8th, $5,744.59, leaving a net balance on hand of $3,171.42.

The Committee instructed Chairman Russell B. Allen, of the Resolutions Committee to notify all concerned that in future, resolutions should be in the hands of his Committee not later than fifteen days prior to Board Meetings.

### State Presidents' Conference

President Ritchie Lawrie reported that good progress has been made in the plans for the State Presidents' Conference to be held at the Deshler-Wallick Hotel, Columbus, Ohio, March 30. To date eleven State Societies have accepted. It was decided to invite representatives of State Societies now in the process of organizing (of which there are a number) to attend the Presidents' Conference.

The Committee approved a motion to accept the invitation to join the Engineers' Joint Council Committee on the Economic Status of the Engineer. An approporiation to cover the expenses of representatives was voted.

A motion was approved that the invitation from N.C.S.B.E.E., to hold a Board Meeting of the NSPE, in conjunction with its Meeting in St. Louis, October 27-28, 1946, be accepted.

An amended budget amounting to $55,000.00 was approved. This sum includes the amount approved in connection with the Engineers' Joint Council.

### Travel Expense Rules

Travel expense allowances was approved, to be acted on in each case by the President for the following:

President; Vice-Presidents (4) Immediate Past Presidents (2); Treasurer; Executive Director; Office Manager, (and other members of the staff as authorized by the President, to attend regular Board Meetings); All members of the Executive Committee, including staff as required when traveling to Committee Meetings, but not to Board Meetings, except as they are officers; All Committee Chairmen to Board Meetings, when authorized, except when also a Board Member. Travel expenses of individual Committee Members would be only as specifically authorized by the Committee Chairmen. It is understood that "Travel" (Administrative and Executive) includes NSPE representatives at various meetings as authorized by the President.

President Lawrie reported that arrangements for the meeting at Atlanta, Dec. 6-7, are progressing satisfactorily.

Favorable action was taken on a motion appointing Russel B. Allen to become Acting Executive Secretary, pending the engagement of a permanent man for this position.

The Committee adjourned at 5:15 p.m.

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## Official 1946 Directory, National Society of Professional Engineers

President Ritchie Lawrie, Jr., has announced his selection of Chairmen and members of all standing committees for the year 1946. These are listed below, following the names and addresses of the National Officers and Executive Committee members, as follows:

### National Officers

President, Ritchie Lawrie, Jr., 321 North Front Street, Harrisburg, Penna.

Vice-President, North-East Area, James F. Fairman, 4 Irving Place, New York 3, N. Y.

Vice-President, Southern Area, Stephen C. Hale, 170 Boulevard, S.E., Atlanta, Georgia.

Vice-President, Western Area, William L. Thrailkill, 1107 W. 7th Avenue, Spokane, Washington.

Vice-President, Central Area, Alex Van Praag, Jr., 447-450 Standard Office Building, Decatur, Illinois.

Treasurer, Leo H. Cleary, 2726 Connecticut Avenue, Washington, D. C.

Office Manager, Mrs. Lacey W Coad, National Press Building, Washington, D. C.

Solicitor, Samuel I. Sacks, 706 Widener Building, Philadelphia 7, Penna.

### Executive Committee

Ritchie Lawrie, Jr., Chairman, 321 North Front Street, Harrisburg, Penna.

S. L. Stolte, 1437 Marshall Avenue, St. Paul 4, Minnesota.

James F. Fairman, 4 Irving Place, New York 3, N. Y.

Hugh C. Clarke, 97 Bentley Avenue, Jersey City, N. J.

Russell B. Allen, 4610 Hartwick Road, College Park, Maryland.

Leo H. Cleary, 2726 Connecticut Avenue, Washington, D. C.

### National Committee Chairmen

Resolutions, Russell B. Allen, 4610 Hartwick Road, College Park, Maryland.

Budget, S. L. Stolte, 1437 Marshall Avenue, St. Paul 4, Minnesota.

Publication, W. L. Larkin, c/o B. F.

Sturtevant Company, 420 Lexington Avenue, New York, N. Y.

Constitution and By-Laws, John W. Shallenberger, 886 Main Street, Bridgeport, Connecticut.

Employment Practices, formerly Fact-Finding — Collective Bargaining, J. S. Kennedy, 2945 Lee Road, Shaker Heights, Ohio.

Educational, Walter H. Wheeler, 802 Metropolitan Life Building, Milwaukee 2, Wisconsin.

Legislative, Ray M. Fuller, 560 North 16th Street, Philadelphia, Pennsylvania.

Practice and Ethics, Harry E. Nold, 214 Lord Hall, Ohio State University, Columbus 10, Ohio.

Public Relations, Charles E. Doell, 325 City Hall, Minneapolis, Minnesota.

Joint N.C.S.B.E.E., James F. Fairman, 4 Irving Place, New York 3, N. Y.

Nominating, Walter L. Simpson, 2025 Eye Street, N.W., Washington, D. C.

Membership, Eastern, Earl L. Daily, 451 Delaware Street, Woodbury, N. J.

Membership, Western, L. E. Peterson, 312 East Wisconsin Avenue, Milwaukee 2, Wisconsin.

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## Personnel of Committees

### *RESOLUTIONS COMMITTEE*

Russell B. Allen, Chairman, 4610 Hartwick Road, College Park, Maryland.

Hugh C. Clarke, 97 Bentley Avenue, Jersey City, New Jersey.

Stephen C. Hale, 170 Boulevard S. E., Atlanta, Georgia.

### *BUDGET COMMITTEE*

S. L. Stolte, Chairman, 1437 Marshall Avenue, St. Paul 4, Minnesota.

James F. Fairman, 4 Irving Place, New York 3, N. Y.

Leo H. Cleary, 2726 Connecticut Avenue, Washington, D. C.

### *PUBLICATIONS COMMITTEE*

W. L. Larkin, Chairman, c/o B. F Sturtevant Company, 420 Lexington Avenue, New York, N. Y.

Allen Hubbard, 110 Whitney Avenue, New Haven 10, Conn.

Alonzo Jones, 6 Lawrence Ave., West Orange, New Jersey.

### *CONSTITUTION AND BY-LAWS COMMITTEE*

John W. Shallenberger, Chairman, 886 Main Street, Bridgeport, Conn.

C. W. Burke, 385 Flatbush Avenue Ext., Brooklyn, N. Y.

Samuel I. Sacks, 921 Widener Building, Philadelphia 7, Penna.

### *EMPLOYMENT PRACTICES, FORMERLY, FACT FINDING-COLLECTIVE BARGAINING COMMITTEE*

J. S. Kennedy, Chairman, 2945 Lee Road, Shaker Heights, Ohio.

A. H. Baum, 3159 Allen Avenue, St. Louis, Mo.

J. H. Morgan, 14 Post Office Annex, Urbana, Illinois.

Charles E. Snyder, 721 Mt. Vernon Avenue, Fairmont, West Virginia.

Wm. L. Thrailkill, 1107 West 7th Avenue, Spokane, Washington.

Daniel Kramer, 107 South Girard Street, Woodbury, New Jersey.

John H. Bringhurst, 707 Petroleum Building, Houston, Texas.

### *MEMBERSHIP COMMITTEE, EASTERN AREA*

Earl L. Daily, Chairman, 451 Delaware St., Woodbury, New Jersey.

C. M. Clark, 198 Randolph St., S. Weymouth 90, Mass.

Edward H. Hardie, 715 Clark Street, Westfield, New Jersey.

Clayton A. Miller, 1173 Summer Ave., Schenectady, N. Y.

David Comilli, 6405 Stanton Avenue, Pittsbugh 6, Penna.

Herbert Manncia, 3900 Mt. Vernon Avenue, Presidential Gardens 11, G.W.C., Alexandria, Virginia.

Charles Snyder, 721 Mt. Vernon Ave., Fairmont, W. Virginia.

George L. Fry, Arkansas Highway Dept., Little Rock, Arkansas.

B. M. Hall, Jr., 1607 William Oliver Building, Atlanta, Georgia.

W. A. Kitchen, c/o O. G. E. Company, Oklahoma City, Okla.

J. Neils Thompson, Room 173, Engineering Building, University of Texas, Austin, Texas.

R. Cooper Bailey, P. O. Box 112, Richmond 1, Virginia.

L. M. Read, 42 Florence Avenue, Devon, Connecticut.

Elmer S. Umstead, 78 Whitmarsh St., Providence, R. I.

### *MEMBERSHIP COMMITTEE, WESTERN AREA*

L. E. Peterson, Chairman, 312 East Wisconsin Avenue, Milwaukee 2. Wis.

James M. Whelan, 1322 Plainfield Road, Joliet, Illinois.

L. M. Condrey, 3436 N. Temple Avenue, Indianapolis, Indiana.

C. H. Scholer, Kansas State College, Manhattan, Kansas.

S. L. Stolte, 1437 Marshall Avenue, St. Paul, Minn.

Bruce Williams, Box 264, Joplin, Missouri.

A. H. Moellenkamp, 503 Civic Loan Building, Lancaster, Ohio.

P. G. Ellis, Wis. Pub. Service Corp., Milwaukee 1, Wis.

### *EDUCATIONAL COMMITTEE*

Walter H. Wheeler, Chairman, (3 years) 802 Metropolitan Life Building, Minneapolis, Minnesota.

M. C. Withey (3 years) University of Wisconsin, Madison 6, Wisconsin.

Joseph Weil (1 year) University of Florida, Gainesville, Florida.

R. S. King (1 year) Georgia School of Technology, Atlanta, Georgia.

H. H. Munger (2 years) Kansas State College, Box E, Manhattan, Kansas.

A. F. Greaves-Walker (1 year) No Caro. State College of Agriculture and Engineering, Raleigh, North Carolina.

Norman D. Bosworth (2 years), c/o E. B. Badger & Sons Company, 75 Pitts St., Boston, Mass.

Samuel Baker (2 years) 1517 Quincy Avenue, Scranton, Pennsylvania.

(One vacancy to be filled later)

### *LEGISLATIVE COMMITTEE*

Ray M. Fuller, Chairman, 560 North 16th St., Philadelphia 30, Penna.

Frederick W. L. Hill, 6440 Barnaby St., N.W., Washington, D. C.

A. G Stanford, 706 Bona Allen Building, Atlanta, Georgia.

T. G. LeClair, 72 West Adams Street, Chicago, Illinois.

Walter W. Walb, 2511 W. Taylor, Fort Wayne, Indiana.

C. Y. Thomas, P. O. Box 604, Pittsburgh, Kans.

Harold E. Chard, Minnesota Highway Dept., St. Paul 4. Minnesota.

L. E. Ordelheide, State Board of Health, Jefferson City, Missouri.

Merton Adams, 803 No. Penna, Avenue Morrisville, Penna.

Robert C. Wheeler, 36 State Street, Albany 7, New York.

Walter W. Graf, Municipal Building Lancaster, Ohio.

E. J. Kallevang, Wis. P. & L. Co., Madison 1, Wis.

C. N. Wiley, P. O. Box 509, Milford, Conn.

E. C. Baker, A. & M. College, Stillwater, Okla.

Victor J. Snyder, 2400 North 2nd Street Harrisburg, Penna.

Henry Ise, 15 Slocum Street, Providence R. I.

Alexis McCormick, 611 Graustark, Houston, Texas.

Gen. Steward W. Anderson, 416 V.M.I. Parade, Lexington, Virginia.

Mortimer W. Smith, 2023 Quarrier St. Charleston 1, West. Va.

D. D. Rickets, 218 Terminal Warehouse Little Rock, Ark.

(Subject to change by Member State Societies which have not made 1946 appointments.)

### *PRACTICE AND ETHICS COMMITTEE*

Harry E. Nold, Chairman (3 years) 214 Lord Hall, Ohio State University, Columbus 10, Ohio.

A. G. Stanford (1 year) 706 Bona Allen Building, Atlanta, Georgia.

Charles Foster (1 year) 316 Medical Arts Building, Duluth, Minn.

Bruce Williams (3 years) P.O. Box 264, Joplin, Missouri.

David Camilli ( years) 6405 Stanton Avenue Pittsburgh 6, Penna.

George F. Chism (1 year), Lake George New York.

J. W. Shallenberger (2 years) 886 Main Street, Bridgeport, Conn.

Brother Amandus Leo (2 years), Manhattan College, Bronx. N. Y.

R. N. Waid (2 years), 176 Torrence Road, Columbus, Ohio.

### *PUBLIC RELATIONS COMMITTEE*

Charles E. Doell, Chairman (2 years) 325 City Hall, Minneapolis, Minnesota.

Merrill Weed (3 years), 1674 Andover Road, Columbus, Ohio.

M. W. Cameron (1 year), 3632 Guilford Avenue, Indianapolis, Ind.

William L. Thrailkill (1 year) 1107 West 17h Avenue, Spokane, Washington

John R. Shoffner (3 years), Keystone Building. Kittanning, Penna.

C. J. McLean (2 years), 207 East Boyd Street, Dixon, Illinois.

Trigg Twitchell (2 years), 3208 Harris

# Our Emergency Fund

Under date of February 7th, 1946, President Ritchie Lawrie, Jr., mailed to members of the National Society of Professional Engineers, a request for Contributions to support the 1946 work of the Society. These additional funds are required to implement the decision of the Board of Directors at their meeting in Cleveland for an immediate expansion of the Society's activities during the next 12 months.

As the copy is going in for the March issue of the American Engineer, the responses to this appeal have been widespread and in substantial volume. There is every indication, even at this time, that the membership is enthusiastically getting behind the Program. A full report of the progress of this campaign will be published in a later issue of the Magazine.

Obviously it would be a physical impossibility for President Lawrie personally to acknowledge each of these contributions individually. However he has expressed his desire to have every member know of his deep appreciation of the cooperation he is receiving as evidenced by the prompt and generous response to his appeal in this emergency. He is especially grateful for the many expressions of encouragement and good will which have accompanied the early remittances thus far received, and takes this means to acknowledge letters from:

R. C. Earlougher, Tulsa, Oklahoma.
John B. Johnson, Kansas City, Missouri.
Saul Blickman, Weehawken, New Jersey.
L. R. Tansley, Columbus, Ohio.
M. L. Todd, Waterloo, Iowa.
Leo Dubinski, San Antonio, Texas.
Harry Darby, Kansas City, Missouri.
E. Faber Biggert, Columbus, Ohio.
Engr. Don K. Kutchera, Neenah, Wisconsin.
Carol Levison, Cleveland, Ohio.
DeWitt C. Griffin, Seattle, Washington.
S. F. Ganter, New Haven, Connecticut.
F. A. Gruetjen, Milwaukee, Wisconsin.
Allen W. Reid, West Lawn, Pennsylvania.
Delos M. Palmer, Toledo, Ohio.
Alfred McMurdie, Albany, New York.
Henry A. Simpson, New York, New York.
Norman S. Bosworth, Boston, Massachusetts.
Frank H. Mason, Augusta, Maine.
W. Z. Lidicker, Forest Hills, New York.
Blake R. VanLeer, Atlanta, Georgia.
A. C. Buensod, New York, New York.
C. L. Emerson, Atlanta, Georgia.
Fred A. Luber, Milwaukee, Wisconsin.
O. E. Sords, Akron, Ohio.
H. J. Dawson, Syracuse, New York.
B. M. Dawson, Syracuse, New York.
P. L. Alger, Schenectady, New York.
Herman K. Kuhn, Tiffin, Ohio.
H. R. Lloyd, Cambridge, Ohio. (Not a member.)
John F. Hennessy, New York, New York.
W. L. Lewis, Erie, Pennsylvania.
M. L. MacLean, Larchmont, New York.
William F. Ryan, Boston, Massachusetts.
A. L. Mathis, Chicago, Illinois.
R. O. Hartman, Decatur, Ill.
R. J. Wolfangle, St. Paul, Minn.
P. H. Roettger, Indianapolis, Ind.
Robert Floyd, Geneva, N. Y.
M. H. Foley, New York, N. Y.
J. D. Skinner, Bridgeport, Conn.
W. R. Kremer, Milwaukee, Wisconsin.
Aloysius E. Cooke, New Haven, Conn.
Fred Manley, Knoxville, Tennessee.
Thomas C. Desmond, Albany, New York.
C. R. Yater, Shelbyville, Indiana.
Blair A. Rieth, Goshen, Indiana.
Robert L. J. Wagar, Bellevue, Ohio.
A. J. Schafmayer, Chicago, Illinois.
Lawrence H. Coffin, Cincinnati, Ohio.
George B. Watkins, Toledo, Ohio.
Philip Sporn, New York, New York.
R. F. Port, Syracuse, New York.
E. F. Vilter, Milwaukee, Wisconsin.
A. G. Peter, Aberdeen Proving Grounds, Md.
James R. Fuller, Kampsville, Illinois.
Mr. Carroll, Maplewood, New Jersey.
Perry J. Goldman, Philadelphia, Penn.
William P. Little, Bridgeport, Conn.
D. B. Steinman, New York, New York.
Alphonse N. Becker, Milwaukee, Wisconsin.
William S. Hammaker, Harrisburg, Penn.
Rollin F. MacDowell, Cleveland, Ohio.
John H. Wickersham, Lancaster, Penn.
Sydney Wood, Lake Bluff, Illinois.
C. M. Roos, East St. Louis, Ill.
W. W. Purdy, Mansfield, Ohio.
Lawrence E. Peterson, Milwaukee, Wis.
Randolph W. Mallick, East Pittsburgh, Penn.
Carl Oman, Cedar Grove, New Jersey.
Carl A. Stevens, Tulsa, Oklahoma.
R. E. Simpson, Indianapolis, Indiana.
L. E. St. John, Binghamton, New Jersey.
S. W. Schellkoff, Schenectady, New York.
Herbert A. Bogard, Indianapolis, Indiana.
John S. H. Wendes, Englewood, New Jersey.
Francis S. Friel, Philadelphia, Penn.
C. H. Van Eman, Houston, Texas.
R. S. King, Atlanta, Georgia.
Ben H. Petty, W. Lafayette, Indiana.
Willis F. Thompson, New Haven, Conn.
C. W. Britzius, St. Paul, Minn.
Ernest Gschwender, Detroit, Michigan.
Archibald F. Glover, Brooklyn, N. Y.
William P. Sanzenbacher, Toledo, Ohio.
A. H. Baum, St. Louis Missouri.
W. R. Wolfe, Muskogee, Oklahoma.
Frederick T. Hicks, Detroit, Michigan.
A. F. Eschenfelder, Glen Ridge, New Jersey.
Joseph B. Estabrook, Minneapolis, Minnesota.
H. H. Higbie, Ann Arbor, Michigan.
L. L. Cain, High Point, North Carolina.
Harold C. Rawley, Philadelphia, Pennsylvania.
Charles Grayson, Troy, New York.
Herbert H. Lake Panama City, Florida.
S. P. Kingston, Rochester, Minnesota.
P. & F. & Associates, Columbus, Ohio.
Roger D. McCoy, Joliet, Illinois.
Ircin H. Frailey, Windber, Pennsylvania.
R. H. Schwendler, Painsville, Ohio.
F. J. Cellarius, Dayton, Ohio.
H. E. Frolicher, Cincinnati, Ohio.
H. A. Nunlist, Cincinnati, Ohio.
Wm. F. Tubesing, North Hollywood, Calif.
Michael Valenti, Trenton, New Jersey.

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Park Avenue, Austin, Texas.

H. J. Bruegging, (1 year), P. O. Box 365, Jefferson City, Missouri.
(One vacancy to be appointed later.)

*JOINT N.C.S.B.E.E. COMMITTEE*

J. F. Fairman, Chairman, 4 Irving Place New York 3, N. Y.

E. A. Holbrook, University of Pittsburgh, Pittsburgh, Penna.

C. George Krueger, 85 Van Reypen Street, Jersey City N. J.

L. S. Finch, Route 4, Box 771, Indianapolis 44, Indiana.

H. E. McWethy, 1 South 11th Street Minneapolis, Minnesota.

*NOMINATING COMMITTEE*

Walter L. Simpson, Chairman, 2025 Eye Street, N.W., Washington, D. C.

John F. Hale, 500 Municipal Building Dayton, Ohio.

Charles S. Larkey, Box 521, Tulsa 2 Oklahoma.

Leland R. Post, c/o N. Y. Telephone Company, Binghamton, N. Y.

Hugh C. Clarke, 97 Bentley Avenue Jersey City, N. J.

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The many friends of Edward Larson, for many years Executive Secretary of the National Society of Professional Engineers, with headquarters in Washington, D. C., will be pleased to know he has resumed his practice as a consulting engineer. His business address is 830 Main Street, Cincinnati, Ohio.

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General Patton on war. "No wars are logical, because logical thinkers would not create them. Therefore, we have to conclude that wars are started by madmen—madmen who claim some kind of outrage." Sounds like Gen. Smedley D. Butler, who wrote: "War is a racket."

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Estimates have been made indicating that semi-skilled workers in the textile industry are able, by means of the machines they operate, actually to replace as many as 25,000 highly skilled hand spinners of the pre-machine age.

# The Illinois Society of Professional Engineers Elects Officers

At its sixty-first annual meeting on January 25-26, in Rockford, the Illinois Society of Engineers changed its name to "The Illinois Society of Professional Engineers." The newly elected State officers for 1946 are as follows:

President.....G. H. Anderson
VicePresident.....D. M. Campbell
Past President.....C. J. McLean
Director.....J. M. Whelan
Director.....W. B. Worsham
Secy.-Treas. .....H. E. Babbitt
N.S.P.E. Repr. .....W. A. Oliver

Nine sections presented twelve papers, most of them more of a professional than purely technical nature. Although the paid registration of 169 was relatively low, the attendance at the sessions was large, owing to the high quality of the papers. At the Friday luncheon Prof. T. C. Shedd, Chairman Professional Engineers Examining Board spoke on "The Illinois Professional Engineering Act" in which many unexpected problems in the administration of the law were clearly presented. It was brought out that reciprocity cannot be expected for those that obtain the license under the grandfather clause, but only for those that obtain it after examination.

### S. L. Stolte Speaks

At the banquet the honorary members were presented. S. L. Stolte, National Director of N. S. P. E., reported on the publicity activity of the professional engineers in Minnesota which brings the activity of engineers to the attention of the public. The society is working on two problems to do something for the improvement of the professional welfare, namely unification of effort and handling of the effect of unions. Unity of purpose brings engineers together no matter what type of struggle they have to define professional engineering. To get somewhere many types of unities have to be agreed on, as unity of regulations, of standards, of practices and ethics and of representation. Everybody has to cooperate to get results.

### Economics, The Topic

The principal address at the annual banquet was given by J. H. Van Deventer, Editorial Director, The Iron Age. He declared that wealth is produced by productivity and can only be increased by higher efficiency, higher productivity per man hour. The fruits of increased productivity are due to the activity of the engineers although they do not always obtain credit for it. Three methods have been proposed to increase wealth: (1) distribution of profits. This is mainly promoted by labor, but would only give an increase of about 5 percent. (2) public subsidies. This brings straight inflation. (3) increased productivity per man hour. This is considered the only safe way. To get this effectively we must remedy the distrust between labor and management. Collective bargaining is here to stay but it must be real bargaining. At present an increase in efficiency is hindered not only by the attitude of labor, but also because management is limited in its managing possibilities by outside regulations and as taxes prevent new developments. Let's take off the brakes, as maximum production is a social necessity.

The business meeting was of great importance as the report of the tellers showed that the recent referendum indicated acceptance of the new constitution and the code of fees, salaries and ethics. The new constitution brings the Illinois Society of Engineers closer to the N. S. P. E., changes the name to the Illinois Society of Professional Engineers, and provides that all officers of the society and its chapters shall be members of the N. S. P. E. The internal organization of the society is somewhat simplified, as the technical sections are abolished. Their activity will be taken over by the Program committee, which will be better able to unify the efforts towards stressing professional and welfare problems.

The report of the Secretary-Treasurer showed that the financial position of the society is sound. The membership increased during the last year from 855 to 1437 owing to a special drive in connection with the registration act. The society has now 11 chapters. With the registration now in force, it can be expected that the membership in N. S. P. E. will also increase in Illinois.

## ILLINOIS

### Van Pragg to Receive Illinois Award

The Committee on the Illinois Award consisting of W. A. Oliver, Chairman, H. E. Bartholomew and C. A. Walls has unanimously agreed that the Illinois Award for 1945 should go to Mr. Alex Van Praag, Jr., for his paper, "The Small Public Waterworks System, Its Romance and Its Tragedy," which was published in the ILLINOIS ENGINEER for December, 1945. Mr. Van Praag is a member of the consulting firm of Warren and Van Praag of Decatur.

Other winners of the Illinois Award have been:

1944. S. M. Wood, "Erosion of Our Coastal Frontiers. Part II."
1943. A. P. Greensfelder. "The Civil Engineer in War and Post-War Activities."
1942. F. L. Osborn. "Engineering Insurance."
1941. H. E. Babbitt. "The Flow of Mud and Sludge."
1939. S. M. Wood. "Stages of Victria Nyanza."
1938. J. R. Longley. "The Gas Power of the Greater Peoria Sanitary District."
1937. L. C. Whittemore and N. E. Anderson. "Design of Sewage Treatment Works of the Sanitary District of Chicago."
1936. S. M. Wood. "The Cycle of the Great Lakes."
1934. A. C. Stanfield. "Some Features of the Flora, Illinois, Water Supply System."
1933. M. B. Reynolds and A. E. Gorman. "Chicago's Water Pollution Problem—Past and Future."
1932. W. B. Walraven. "Development of Power from Sewage Sludge Gas."
1931. W. W. Mathews. "The Galesburg Sanitary District."

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President Ritchie Lawrie, Jr., announces the resignation of Col. Wm. A. Hardenberg as the NSPE representative on the Advisory Committee of the U. S. Department of Agriculture Graduate School, Washington, D. C. Col. Hardenberg's residence is now in New York City. W. J. Lynett, of Washington, D. C., has accepted the Society's invitation to fill the post vacated by Col. Hardenberg.

## MINNESOTA

### Minnesota Federation of Engineering Societies

A strong program of addresses and discussions on engineering, industrial and other timely subjects, together with the greatest display of machinery and engineered products in northwest history, greeted those attending the 1946 Victory Conference and Exposition of the Minnesota Federation of Engineering Societies, in Minneapolis on February 20-23. The convention was held at Hotel Radisson and the exposition, heralded as "Northwest Industries' First Great Reconversion Show," was staged at the Minneapolis Armory.

Both were under direction of Howard C. Jacobson, president of the Minnesota Federation of Engineering Societies, an organization of the state's 14 clubs and associations of professional engineers, and Edwin T. Hutchinson, general chairman. C. W. Bros was in charge of conference programs and Galen J. Jasper and Fred Klass were co-chairmen of the exhibits committee.

Aviation, radar, sonar, television, radio communication, atomic energy, air conditioning and the new equipment and materials they will use in the postwar era were among the subjects discussed and demonstrated at the conference and exposition.

Well over 100 exhibitors occupied show space and their displays included 15 "live exhibits," demonstrating use of new equipment, processes and products developed by American industry during the years.

In operation throughout the exposition was a complete modern machine shop, plating plant, gas welding and flame cutting machines, core-drilling machines, rock crushers, screening plants, giant and small Diesel engines, both portable and factory-size electric power and light plants, air compressors, blue-printing machines and many other new instruments and machine tools.

For air-minded engineers, a miniature aviation show displayed a variety of aircraft power plants, including a large jet engine, several new type planes for private operation and a long list of aircraft accessories. The exposition also featured a complete radio broadcasting station in operation at the armory and continuous sound pictures showing new industrial equipment and processes.

Definite objectives of the show and conference were to give the public a better understanding of the vital work performed by skilled engineers, to stimulate new ideas among members of the engineering profession and thus speed the development of new industries and new products, insuring more jobs for war veterans and other workers and greater development of Minnesota's vast natural resources.

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## Rhode Island Society Elects Officers For 1946

*Charles E. Blais, President of the Rhode Island Society of Professional Engineers*

*Daniel O. Cargill, NSPE Director For the Rhode Island Society of Professional Engineers*

As a prelude to an aggressive and well planned membership drive, the Rhode Island Society of Professional Engineers has elected the following State officers for the year 1946:

President, Charles E. Blais,
First Vice-President, Carmen J. Longo,
Second Vice-President, Lester P. Manning,
Secretary, Vincent DiMase,
Treasurer, Joseph Wuraftic,
National Director, Daniel O. Cargill.

Vincent DiMase, secretary of the RISPE advises that the Rhode Island Society, under the able leadership of president Charles E. Blais, has already embarked on an intensive and energetic program of activities aimed to set a new record for the year 1946. Many interesting meetings are being planned for the members and for the education of the public at large as to the key position occupied by professional engineers in this American technological civilization which is indispensable to our "American way of life."

The NSPE is expecting great things of the Rhode Island Society for the coming year, based on its past record as well as upon its selection of officers for 1946.

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It's more or less human nature to be "prejudiced" against the type of dominating personality who will ask you a question, then answer it for you, and finally insist that you are badly mistaken.

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Mark Twain's home overflowed with books. When a friend commented on the lack of shelf space, and the books stacked everywhere in his library, Mark Twain explained, "You know how hard it is to borrow bookcases."

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According to a University of Chicago professor of psychology, "A snob is not a superior person. He has an inferiority complex and is very unhappy about it. His high-hat manner is an unpleasant and unsuccessful attempt to hide his personality problem from other people."

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Representative of too much present-day thinking on public questions of general policy is the following caption to a "Willie and Joe" newspaper cartoon by Mauldin, quoted as the closing remark of an after-dinner speaker: ". . . . and so, fellow Americans, I claim the atom belongs to us—we invented it, didn't we?"

## NEW JERSEY

The Architects to the New Jersey State Capitol Building Commission have announced the appointment of Louis T. Klauder of Moorestown, New Jersey, as the engineer in charge of the design of the mechanical and electrical facilities of the proposed New Jersey State Capitol Office Building at Trenton, New Jersey.

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Professor Philip Kissam of Princeton University and MERCER Chapter is in harness again. Engineer Merton Adams, a strong voice at State Trustee meetings, is the nominee for President of Mercer to succeed Charlie Yard. And Engineers Russell, who worked hard and well as Secretary, has been honored by receiving the 1946 nomination to succeed himself.

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We hear that Leo McKee of Monmouth Ocean has transferred his secretarial duties to Engineer Karl Heuser but will continue as State Trustee. Bruce M. Larrabee, Sr., formerly Senior Engineer, U. S. War Department, has reopened his offices at 31 Main Street, Toms River.

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Engineer Daniel M. Kramer succeeded First Past President Stephen G. Szabo on January 1, 1946. President Kramer has been untiring in his efforts and enthusiasm in Society and Professional matters for some years past. He brings to the presidency able leadership qualities and a thorough understanding of the philosophy of the professional engineering movement. If ever an honor was deserved, this one was. Dan has missed but one Trustees' meeting in 3 years and has been untiring in his efforts. The interest of the Society and Profession are close to his heart and, if elected, we look forward to a highly successful and progressive year under his leadership.

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South Jersey, despite vast areas to travel, is to be commended on its large meeting attendances—58 were present at a recent meeting in Atlantic City. We can't close without observing the fact that Engineer Fred Baum is doing a triple job . . . as Secretary-Treasurer of the State Society, Secretary of the South Jersey Chapter, and Secretary of Headquarters Chapter . . . and doing all well.

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Under the leadership of Hugh C. Clarke the Hudson County Society has enjoyed the most successful year in our chapter history both from a social and professional viewpoint. Engineer Farmer and his committee have increased our membership to 252 full members and 87 associates. Engineer Farmer has also done a splendid job as chairman of the State Membership Committee enabling us to have three representatives in the National Society.

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## NEW YORK

Lt. Col. George H. Bruns, a Member and Past President of the Queens NYSSPE, has been appointed Deputy Hospital Commissioner of the City of New York. He will be assigned to engineering duties in the Hospital Department and will supervise the post-war construction of hospitals.

Colonel Bruns, who is a Civil Engineer, is the inventor of the retractile airplane wing and has written extensively on City planning subjects. He was associated with the Washington Bi-Centennial Commission and the World's Fair Commission. He was active in the campaign to build the Queens General Court House in Jamaica and was a pioneer in the successful drive for a Congressional and State reapportionment in Queens.

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George E| Spargo, a member of the Queens County Chapter NYSSPE was chosen Deputy Mayor by William O'Dwyer, Mayor of the City of New York. Mr. Spargo will hold this post in addition to his activities with the Triborough Bridge Authority and the New York Tunnel Authority. Mr. Spargo brings to his assignment a thorough knowledge of City government and a keen understanding of public affairs.

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Dr. Dwayne Orton, Director of Education for International Business Machine Corporation, spoke on the subject, "Human Engineering in the Atomic Age," before the Erie Chapter meeting in Buffalo, on January 11th. He pointed out that with a shrinking world and vastly expanding resources of extraneous power available for man's use, the science of improving human relationships is a *must* if civilization is to survive.

Announcement was made of the progress being made in establishing an office of the New York State Department of Labor, Division of Engineering, and also the Board of Standards in Buffalo, as outlined in a letter from George J. Mack, chairman of the Legislative Committee.

Among the guests present were: Robert M. Fowler, chairman, American Chemical Society; Lt. Col. Harland C. Woods, chairman, American Society Civil Engineers; E. C. Norton, chairman, Society Automotive Engineers; Kenneth K. Koontz, Pres., Engineering Society of Buffalo; J. D. Dickerson, chairman, American Society for Metals; Albert W. Eckstrom, chairman, American Society Mechanical Engineers; F. A. Moesel, President, A.S.H.V.E.; Frederick Lieverpiper, Sec'y American Inst. of Chemists; R. D. Belden, Vice-Pres. Dunlop Tire & Rubber Corp.; Messers: L. A. Johnson, P. Moffat, T. J. Clinton and T. Pottage of International Business Machine Corp.; C. B. McBride, Pres. Cattaraugus-Chautauqua Chapter and Schyler Jenkins, Pres. of Niagara Chapter, N. Y. State Society, Professional Engineers.

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## OHIO

The retiring President of the Ohio State Society of Professional Engineers, John F. Hale writes the following letter to the organization just prior to the State Society's annual convention in Akron, February 14-15th:

"Fellow Engineers:

"In this my final letter to you as President of the Ohio Society I want to thank each and everyone for the fine help and cooperation you have given me during the past year.

"I have enjoyed this year a great deal. It has been a real pleasure and a distinct honor to have the privilege of serving as President of this Society. I have tried ot do everything within my power, time permitting, toward the advancement and betterment of this Society and the engineering profession. I have visited thirteen of the local chapters and trust that I have been able to leave with our members in these chapters a few ideas which may help in conducting the affairs of the chapters and the Society.

"The help and cooperation I have received from the officers, the trustees, the committee chairmen and from all the members has been splendid and to everyone I want to express my most sincere appreciation.

"With a membership of almost 3,000 we can certainly say that Ohio is in the lead in this effort to build up a strong National Society. From the

7,000 new applications for registration during 1945 will come many more new members in 1946. I feel quite certain that we will reach that goal of 4,000—*in* 1946.

"The annual convention in Akron on February 14th and 15th is being carefully planned for your pleasure and benefit and I trust you will try to attend. Reports of activities will be presented and your newly elected officers will be installed. To these new officers I extend my best wishes for their success during the coming year.

"Looking forward to seeing you in Akron on February 14th and 15th, I remain,"

Sincerely yours,
John F. Hale

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It will take the board almost a year to complete the consideration of the 5000 applications they still have on file. They plan to present certificates at two public ceremonies during 1945 in conjunction with OSPE Chapter meetings—probably in May and October. OSPE can well be proud of Ohio's board for all of them are members and four of them are past presidents of the Society.

## TEXAS

### Texas Society, Annual Meeting

The 10th annual convention of the Texas Society of Professional Engineers was held in Houston on January 14 and 15 and was well attended.

The growth and recognition of the Texas Society is attested by the type and character of speakers at the convention. They included the Hon. Weaver Baker, Chairman of the State Board of Control; Mr. Bertram E. Giesecke, President, Texas Society of Architects; Mr. Max Jacobs, Public Relations Counsel, The Houston Post; The Hon. D. A. Simmons, President, The American Bar Association; Mr. James Noel speaking for the Hon. Grover Sellers, Attorney General of Texas; and, Dean W. R. Woolrich, of the College of Engineering, University of Texas. All of the talks were both practical and inspiring and will contribute to the continued growth of the Society.

The physical growth of the Society is evidenced by the fact the membership has passed the 1200 mark and three chapters having been added during the year 1945.

During 1945 a determination to provide the means to employ a full-time, paid, executive secretary was successful and in December a special committee was appointed to find and recommend an individual for this Key position.

To the outgoing president, Mr. Elgin B. Robertson, the Society owes much for the inspiring and effective leadership he has provided in 1945. From the new president, Mr. James P. Exum, much is expected and he has pledged his vigorous support.

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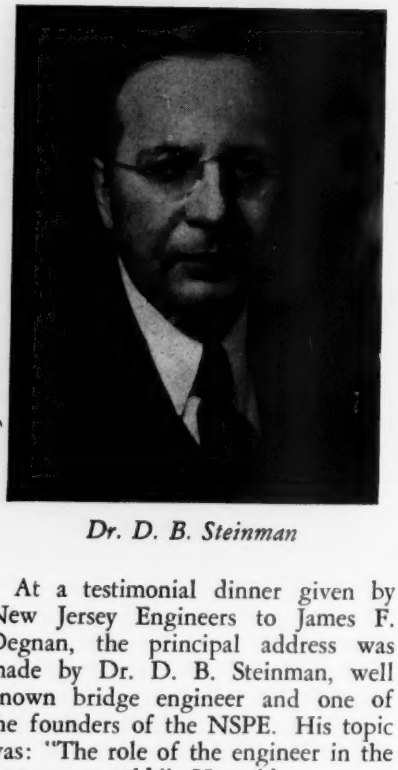
# The Engineer in the Post War World



*Dr. D. B. Steinman*

At a testimonial dinner given by New Jersey Engineers to James F. Degnan, the principal address was made by Dr. D. B. Steinman, well known bridge engineer and one of the founders of the NSPE. His topic was: "The role of the engineer in the post war world." He said:

"The recent world war was primarily a contest of technological progress and resourcefulness expressed in productive capacity. Engineering won the war, and engineering will have the task of reconstruction."

Dr. Steinman reminded the engineers that war stimulates discovery and accelerates its applications, and continuing said, "Even before the war was ended, large-scale programs were already planned for 'beating swords into ploughshares'. The largest companies manufacturing powder for munitions have their plans ready to convert their plans to the expanded production of non-explosive lines after the war.

"The chemical companies are ready to spend many millions of dollars on new plants in their postwar program. Postwar plans have already been made for doubling the production of plastics. Electric furnaces for producing steel now have a capacity of 5,000,000 tons a year, or over five times their pre-war capacity.

The automotive industry, with $15 billion of plants used for war production, has plans ready for a 50 per cent increase in output of automobiles and trucks above pre-war levels. The U. S. government spent 10 billion to construct some 2,000 war plants, and these await early reconversion to peacetime uses."

### Housing Improvements

The speaker emphasized the improvement in housing designs, saying, "Home architecture will be transformed by new ideas in heating, lighting, and air-conditioning. Radiant heating systems will be introduced, with the entire wall area or floor area a giant radiator, or with electric heating fixtures pouring fourth infra-red rays at the touch of a switch. To make improved housing accessible to all, prefabrication will reach a high stage of development."

Dr. Steinman reminded the engineers that the profession is needed in the solution of the social, economic and political problems confronting the world, and closed his remarks by saying, "The engineer can make an invaluable contribution by utilizing the same talents and the same straight-line thinking that proved so valuable in war. Men can fight and destroy for a time but they can build forever. In the postwar world, the engineer finds his challenge and his opportunity."

Engineer Degnan was commended by James Wheeler, plant manager of Alco-Gravure, and Hugh C. Clarke, president of the Hudson County Chapter.

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More than 17,000 scientists have signed a petition demanding that the atomic bomb be shared by all the "Big Five." One spokesman for the group said: "We refuse to be pawns in the game of power politics.

# What's New For Engineers

*Requests for further information concerning any item mentioned under this heading will be promptly referred to the manufacturer. It would be appreciated if inquiries be addressed on professional or company letterhead.*

**Send Inquiries Direct to American Engineer, #6 Church Street, New York, N. Y.**

## HANDBOOK OF STAINLESS STEEL

A 100-page pocket-size (5 x 7½ x 1/8) handbook presenting practical information on 26 types of stainless steels has just been published.

The handbook contains a 44-column finder chart giving analyses, properties, hot working temperatures and heat treatment of the different types and a general discussion of types and properties of stainless. This is followed by a table of corrosion resistance of four leading types of stainless to 230 chemicals and common materials.

Fabrication methods and procedures, occupying 40 pages, describe welding methods; press forming, drawing and blanking; machining techniques; spinning qualities, tools and methods; upsetting and forging; riveting, shearing, sort soldering, silver soldering, annealing and heat treating, grinding, polishing and buffing, and surface treatments, including removal of welding flux, degreasing, sandblasting, pickling, and passivating.

Stainless steel products, including plates, sheet, strip, bars, forging billets, tube stock and tubes, angles, wire, castings, forging, and clad steel are described in a 20-page section. Final pages contain general tables of bar weights, weights of sheet, weights of tubes, feet per pound of wire, decimal equivalents of fractions of an inch, and temperature conversion.

**For further information address American Engineer, reference No. 474.**

## TURBINE OIL BOOKLET

Operating characteristics and advantages of certain oils for steam turbine lubrication and described in a handsome new booklet just issued. The booklet includes a picture story of the exclusive refining process.

Among subjects treated are: 1) How air is actually beneficial to these oils under service conditions in a steam turbine, since it permits oxidation to proceed just far enough to produce additional oiliness. 2) How the process of refining makes this lubricant highly responsive to oxidation and corrosion inhibitors.

**For further information address American Engineer, reference No. 475.**

## DEVICE FOR MEASURING RADIATION

A new calculating Device for Measuring Radiation required for steam and hot water heating systems has been announced ready for public distribution after several years of research and use by heating authorities.

It is claimed this new calculating device (physically a round dial with three concentric celluloid printed discs) eliminates the tedious figuring, usually necessary to determine the correct amount of radiation, and can successfully and easily be used by anyone without previous technical training as its operation is rapid, not involving subtractions, divisions, complicated multiplication, nor the use of a formula. Just the simple turning of a dial and the correct answer is received.

The dial contains sizes of mains, returns, risers, radiator sizes and capacities, round and sectional boiler net ratings, chimney flue sizes and capacities with minimum and maximum heights, hot water tank sizes and capacities, fuel oil tank sizes and capacities, hot water generator capacities and other valuable heating information enabling all individuals who come in contact with heating problems to have the correct answers at their finger tips.

**For further information address American Engineer, reference No. 476.**

## AIR RELIEF VALVES

These Air Relief Valves are depoints of pipe lines of all kinds carrying liquids under pressure. They are intended to provide an easy and effective method of removing air or gases trapped in the line, which otherwise tend to build up in volume and pressure, stalling the pump, reducing the capacity of the line—and sometimes even blocking the flow of the liquid entirely.

The valves are furnished complete with liquid level gauge—with riser threaded to screw into a T fitting or blank for welding to the pipe line. Standard sizes are 2", 3", 4", 6", 8", 10" and 12". Special sizes can be supplied to order.

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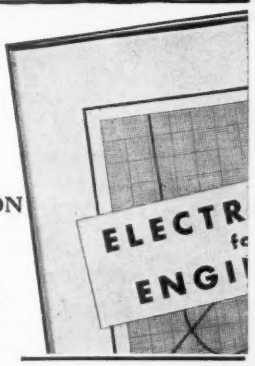


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## A MANUAL ON WELDED FABRICATION

A new engineering manual entitled, "Tailoring in Metal," is now available for engineers and designers. It discusses the factors affecting the choice of Welded Fabrication and the techniques of welded design. As stated by the author, the purpose of the manual is to help engineers and designers decide for themselves if fabrication by welding and the materials made available by this method are applicable to the problem. The factors involved in a decision are cost, weight, strength, appearance, stability, noise, quality, and delivery.

Various types of welds are explained, and how they affect static and fatigue load values. Of particular interest to the designer is specific information about devices which can be employed to reduce cost and improve construction. The methods are profusely illustrated with drawings and photographs.

**For further information address American Engineer, reference No. 478.**

## RECORDING AND INDICATING INSTRUMENTS

There has just been issued a comprehensive catalog describing a full line of Recording and Indicating Instruments for measurement and control. Arranged for quick reference, and profusely illustrated, the sections deal with instruments for temperature applications, pressure, humidity, flow, liquid level, density, and other process variables. Control valves, planimeters, instrument accessories and supplies are included.

This catalog is the first in which this manufacturer has been able to show its line of electronic instruments, the sale and use of which has, until recently, been limited to military applications.

A complete list of the manufacturer's branches in North America and of its overseas representatives is given.

**For further information address American Engineer, reference No. 479.**

## CONDENSERS AND COOLERS THAT ELIMINATE WATER SUPPLY PROBLEMS

Engineers and process men who wish to avoid the expense, complication and problems of a water supply system for condensers and coolers will be particularly interested in this recently published 8-page, 2-color bulletin.

The first portion of the bulletin describes a "package-type unit" and lists more than twenty advantages claimed for this exchanger for condensing and cooling fluids without the use of water. Typical applications are listed to show the wide adaptability of the unit, and illustrations show how these exchangers are adapted to large or small heat transfer requirements.

The final portion of the bulletin describes the design and construction that provide a compact, durable and effective heat exchanger.

**For further information address American Engineer, reference No. 480.**